Configuration Name : My Configuration

Configuration ID : 4130bce9-de32-43a8-9b26-428cf8cdb602

Date : Wed Mar 05 08:20:59 UTC 2025

Bom Level	No.	Reference	Descript
Controller + I/O	1	LMC100CAA10000	Motion c
Controller + I/O	2	ABL8WPS24200	Regulate 500V AC

Controller + I/O	3	ABL8BBU24200	battery c ABL8, 24
Controller + I/O	4	ABL8BBU24400	battery c ABL8, 24
Controller + I/O	5	ABL8RED24400	redunda
Controller + I/O	6	ABL8PRP24100	electron for regu
Controller + I/O	7	ABL8BUF24400	buffer m

Description
Motion controller LMC100 0 axis - Acc kit - Basic
Regulated switch power supply, modicon power supply, 3 phases, 380 to 500V AC, 24V, 20A
battery control module, phaseo ABL7 ABL8, 24 to 28.8V DC, phaseo ABL7 ABL8, 24V, 20A, for regulated SMPS
battery control module, phaseo ABL7 ABL8, 24 to 28.8V DC, phaseo ABL7 ABL8, 24V, 40A, for regulated SMPS
redundancy module, phaseo ABL7 ABL8, 40A, for regulated SMPS
electronic protection module, phaseo ABL7 ABL8, 28 to 28.8V DC, 10A, for regulated SMPS, 2 pole breaking by channel
buffer module, phaseo ABL7 ABL8, 24 to 28.8V DC, 40A, for power supply

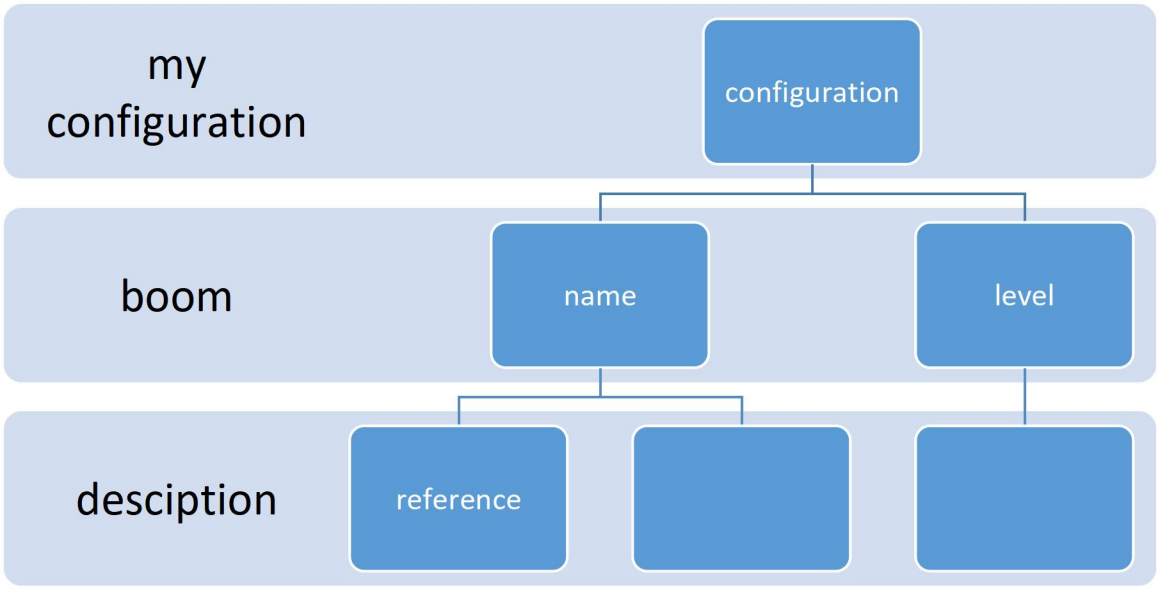
Configuration

Name:	My Configuration
Configuration ID	49c77cc5-cae3-4f83-97c8-ebd0fe2c2c3c
Date:	Wed Mar 05 08:10:24 UTC 2025

Main product	Part Number	Accessories	Accessories - Part Number	Short description

Breaker	C63H31M500			Circuit breaker, ComPacT N poles, MicroLogic 1.3M trip
Contactor	LC1G265LSEA			High power contactor, TeSy 3 <=440V 265A, advanced v band AC/DC coil
		Remote Wear Diagnostic (RWD) Module	LA9GRD01	Remote Wear Diagnostic M Giga contactor LC1G
Contactor	LC1G265LSEA			High power contactor, TeSy 3 <=440V 265A, advanced v band AC/DC coil
Contactor	LC1G150LSEA			High power contactor, TeSy 3 <=440V 150A, advanced v band AC/DC coil
Thermal Relay	LR9G500			Electronic thermal overload 500 A,class 5E-30E,push-in

Accessories - Part Number	Short description	Quantity
	Circuit breaker, ComPacT NSX630H, 70kA/415VAC, 3 poles, MicroLogic 1.3M trip unit 500A	1
	High power contactor, TeSys Giga, 3 pole (3NO), AC-3 <=440V 265A, advanced version, 200…500V wide band AC/DC coil	1
LA9GRD01	Remote Wear Diagnostic Module (NC), for TeSys Giga contactor LC1G	1
	High power contactor, TeSys Giga, 3 pole (3NO), AC-3 <=440V 265A, advanced version, 200…500V wide band AC/DC coil	1
	High power contactor, TeSys Giga, 3 pole (3NO), AC-3 <=440V 150A, advanced version, 200…500V wide band AC/DC coil	1
	Electronic thermal overload relay,TeSys Giga,125-500 A,class 5E-30E,push-in control connection	1


my configuration
configuration
boom
name
level
desciption
reference

Course Name	New 2024 Pricin Classroom Traini (6% increase) - ex vat
Manufacturing Execution System Software (MES)	
Ampla Performance (On Demand)	ZAR 10,500.00
Schneider Electric PLC (M340/M580/TM221,M262)	
Introduction to PLC - level 1	ZAR 10,500.00
EcoStruxure Control Expert Programming - level 2	ZAR 17,500.00
EcoStruxure Control Expert Intermediate level - level 3	ZAR 3,600.00
M580 Programming - level 4	ZAR 10,500.00
Introduction to SOMachine (On Demand)	ZAR 7,000.00
M262 Programming (On Demand)	#REF!
EcoStruxure Process Expert (Hybrid DCS)	
EcoStruxure Process Expert (On Demand)	ZAR 17,500.00
Supervisory Control & Data Acquisition software (SCADA)	
Citect Configuration 2018	ZAR 13,900.00
Citect 2018 – Workspace and Situational Awareness (On Demand)	ZAR 7,000.00
Cicode Programming (On Demand)	ZAR 7,000.00
Citect Architecture & Redundancy (On Demand)	ZAR 7,000.00
Networking Connectivity	
Principles of Ethernet Networking	ZAR 10,500.00

EcoStruxure Control Expert Modbus & CANopen configuration (On Demand) - Level 4	ZAR 10,500.00
EcoStruxure Control Expert Ethernet IP & Profibus configuration (On Demand) - Level 4	ZAR 10,500.00
Human Machine Interface (HMI)	
HMI Programming (Vijeo Designer)	ZAR 10,500.00
EcoStruxure Machine SCADA Expert (On Demand)	ZAR 13,900.00
Telemetry	
Trio Licensed Radio (On Demand)	ZAR 3,600.00
RemoteConnect – SCADAPack x70 (On Demand)	ZAR 3,600.00
Geo SCADA (On Demand)	ZAR 10,500.00
Motor Controls	
Introduction to Variable Speed Drives	ZAR 7,000.00
Altivar Process Drive Systems	ZAR 7,000.00
EcoStruxure Motor Protection Control (EMPC)	ZAR 10,500.00
Low Voltage	
Low Voltage Electrical Distribution (L.V.E.D)	ZAR 10,500.00
SPD (Surge Protection Device) (On Demand)	ZAR 2,500.00
Medium Voltage (PremSet & RM6)	
Medium Voltage Electrical Distribution (M.V.E.D.)	ZAR 10,500.00
PremSet Customer Training	ZAR 7,000.00
RM6 Customer Training	ZAR 7,000.00
Electrical Novice	
Basic Electrical Training	ZAR 3,600.00
Protection Relay	
Sepam Level 1 - (On Demand)	ZAR 7,000.00
EcoStruxure Power Monitoring Expert (PowerLogic PM3200, 5000, 8000, ION900, ION7400)	
EcoStruxure Power Monitoring Expert: Project Deployment	ZAR 17,500.00

AI Engineer Skill Assessment - Mar 4, 2025 - 1:05:49 PM		
Your overall results	Low	'10/35'
Azure AI Fundamentals	Low	'0/4'
Designing and Implementing a	Moderate	'10/31'

Microsoft Azure AI Solution		
Category	Link-Text	Link
Azure AI Fundamentals		https://learn.microsoft.com
Azure AI Fundamentals	Microsoft Azure AI Fundamentals: Computer Vision	https://learn.microsoft.com/en-us/t azure/
Azure AI Fundamentals	Microsoft Azure AI Fundamentals: Natural Language Processing	https://learn.microsoft.com/en-us/t processing/
Azure AI Fundamentals	Microsoft Azure AI Fundamentals: Document Intelligence and Knowledge Mining	https://learn.microsoft.com/en-us/t mining/
Azure AI Fundamentals	Microsoft Azure AI Fundamentals: Generative AI	https://learn.microsoft.com/en-us/t
Designing and Implementing a Microsoft Azure AI Solution		https://learn.microsoft.com
Designing and Implementing a Microsoft Azure AI Solution	Get started with Azure AI Services	https://learn.microsoft.com/en-us/t
Designing and Implementing a Microsoft Azure AI Solution	Develop decision support solutions with Azure AI Services	https://learn.microsoft.com/en-us/t
Designing and Implementing a Microsoft Azure AI Solution	Create computer vision solutions with Azure AI Vision	https://learn.microsoft.com/en-us/t azure-ai/
Designing and Implementing a Microsoft Azure AI Solution	Develop natural language processing solutions with Azure AI Services	https://learn.microsoft.com/en-us/t
Designing and Implementing a Microsoft Azure AI Solution	Implement knowledge mining with Azure Cognitive Search	https://learn.microsoft.com/en-us/t cognitive-search/
Designing and Implementing a Microsoft Azure AI Solution	Develop solutions with Azure AI Document Intelligence	https://learn.microsoft.com/en-us/t intelligence/
Designing and Implementing a Microsoft Azure AI Solution	Develop Generative AI solutions with Azure OpenAI Service	https://learn.microsoft.com/en-us/t
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Category	Question	Answers
Azure AI Fundamentals	Fundamental AI Concepts	Azure Machine Learning

Azure AI Fundamentals	Fundamental AI Concepts	Azure AI Bot Service
Azure AI Fundamentals	Fundamental AI Concepts	Azure AI Language
Azure AI Fundamentals	Fundamentals of machine learning	Regression
Azure AI Fundamentals	Fundamentals of machine learning	Classification
Azure AI Fundamentals	Fundamentals of machine learning	Clustering
Azure AI Fundamentals	Fundamentals of Azure AI services	A multi-service resource that include
Azure AI Fundamentals	Fundamentals of Azure AI services	A single-service resource for each AI
Azure AI Fundamentals	Fundamentals of Azure AI services	It's not possible to see costs for indiv
Azure AI Fundamentals	Fundamentals of Computer Vision	Timestamps in photograph metadat
Azure AI Fundamentals	Fundamentals of Computer Vision	Pixels
Azure AI Fundamentals	Fundamentals of Computer Vision	Image file names
Azure AI Fundamentals	Fundamentals of Facial Recognition	A pair of coordinates for each face, i
Azure AI Fundamentals	Fundamentals of Facial Recognition	Two pairs of coordinates for each fa
Azure AI Fundamentals	Fundamentals of Facial Recognition	A set of coordinates for each face, d
Azure AI Fundamentals	Fundamentals of optical character recognition	Azure AI Vision
Azure AI Fundamentals	Fundamentals of optical character recognition	Azure AI services
Azure AI Fundamentals	Fundamentals of optical character recognition	Azure AI Language
Azure AI Fundamentals	Fundamentals of Text Analysis with the Language Service	Sentiment analysis
Azure AI Fundamentals	Fundamentals of Text Analysis with the Language Service	Key phrase extraction
Azure AI Fundamentals	Fundamentals of Text Analysis with the Language Service	Entity detection
Azure AI Fundamentals	Fundamentals of question answering with the Language Service	"Create an empty knowledge base, a into it.
Azure AI Fundamentals	Fundamentals of question answering with the Language Service	Import the existing FAQ document in
Azure AI Fundamentals	Fundamentals of question answering with the Language Service	Import a pre-defined chit-chat data s
Azure AI Fundamentals	Fundamentals of conversational language understanding	Azure AI Speech

Azure AI Fundamentals	Fundamentals of conversational language understanding	Azure AI Language
Azure AI Fundamentals	Fundamentals of conversational language understanding	Azure AI services
Azure AI Fundamentals	Fundamentals of Azure AI Speech	Speech
Azure AI Fundamentals	Fundamentals of Azure AI Speech	Language
Azure AI Fundamentals	Fundamentals of Azure AI Speech	Azure AI services
Azure AI Fundamentals	Fundamentals of Azure AI Document Intelligence	Azure AI Vision resource
Azure AI Fundamentals	Fundamentals of Azure AI Document Intelligence	Azure AI Document Intelligence or A
Azure AI Fundamentals	Fundamentals of Azure AI Document Intelligence	Azure AI Language resource.
Azure AI Fundamentals	Fundamentals of Knowledge Mining with Azure Cognitive Search	CSV
Azure AI Fundamentals	Fundamentals of Knowledge Mining with Azure Cognitive Search	SQL
Azure AI Fundamentals	Fundamentals of Knowledge Mining with Azure Cognitive Search	JSON
Azure AI Fundamentals	Fundamentals of Generative AI	Models that only work with one lang
Azure AI Fundamentals	Fundamentals of Generative AI	Models that only work with small an
Azure AI Fundamentals	Fundamentals of Generative AI	Models that use deep learning to pr massive scale.
Azure AI Fundamentals	Fundamentals of Azure OpenAI Service	Azure OpenAI is Microsoft's version models.
Azure AI Fundamentals	Fundamentals of Azure OpenAI Service	ChatGPT and OpenAI are chatbots th Azure OpenAI provides access to the
Azure AI Fundamentals	Fundamentals of Azure OpenAI Service	OpenAI is a research company that d AI models. Azure OpenAI provides a
Azure AI Fundamentals	Fundamentals of Responsible Generative AI	To make a legal case that indemnifie solution
Azure AI Fundamentals	Fundamentals of Responsible Generative AI	To document the purpose, expected
Azure AI Fundamentals	Fundamentals of Responsible Generative AI	To evaluate the cost of cloud service
Designing and Implementing a Microsoft Azure AI Solution	Prepare to develop AI solutions on Azure	Absolutely correct values based on c
Designing and Implementing a	Prepare to develop AI solutions on Azure	Randomly selected values with an ec

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Prepare to develop AI solutions on Azure	Probabilistic values based on correla
Designing and Implementing a Microsoft Azure AI Solution	Create and consume Azure AI services	The application must specify a valid
Designing and Implementing a Microsoft Azure AI Solution	Create and consume Azure AI services	The user of the application must ent Azure subscription.
Designing and Implementing a Microsoft Azure AI Solution	Create and consume Azure AI services	Access to Azure AI Services is grante
Designing and Implementing a Microsoft Azure AI Solution	Secure Azure AI services	Switch the app to use the secondary
Designing and Implementing a Microsoft Azure AI Solution	Secure Azure AI services	Change the resource endpoint
Designing and Implementing a Microsoft Azure AI Solution	Secure Azure AI services	Enable a firewall
Designing and Implementing a Microsoft Azure AI Solution	Monitor Azure AI services	Create an alert.
Designing and Implementing a Microsoft Azure AI Solution	Monitor Azure AI services	Configure diagnostic settings.
Designing and Implementing a Microsoft Azure AI Solution	Monitor Azure AI services	Create a dashboard.
Designing and Implementing a Microsoft Azure AI Solution	Deploy Azure AI services in containers	Client applications must pass a subs using the container.
Designing and Implementing a Microsoft Azure AI Solution	Deploy Azure AI services in containers	The container must be able to conne data for billing.
Designing and Implementing a Microsoft Azure AI Solution	Deploy Azure AI services in containers	All data passed from the client appli resource endpoint.
Designing and Implementing a Microsoft Azure AI Solution	Make recommendations with Azure AI Personalizer	In the Azure portal, go to the Monito the Personalizer average reward.
Designing and Implementing a Microsoft Azure AI Solution	Make recommendations with Azure AI Personalizer	In the Azure portal, go to the Monito the Baseline average reward.
Designing and Implementing a Microsoft Azure AI Solution	Make recommendations with Azure AI Personalizer	In the Azure portal, go to the Monito the Reward achievement ratio.
Designing and Implementing a Microsoft Azure AI Solution	Analyze images	Tags
Designing and Implementing a	Analyze images	Description

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Analyze images	Categories
Designing and Implementing a Microsoft Azure AI Solution	Classify images	"Image classification (multiclass)
Designing and Implementing a Microsoft Azure AI Solution	Classify images	Image classification (multilabel)
Designing and Implementing a Microsoft Azure AI Solution	Classify images	Object detection
Designing and Implementing a Microsoft Azure AI Solution	Detect objects in images	The location and class of specific cla
Designing and Implementing a Microsoft Azure AI Solution	Detect objects in images	The class of the main subject of an i
Designing and Implementing a Microsoft Azure AI Solution	Detect objects in images	The file type of an image.
Designing and Implementing a Microsoft Azure AI Solution	Detect, analyze, and recognize faces	Location
Designing and Implementing a Microsoft Azure AI Solution	Detect, analyze, and recognize faces	Type of eye-glasses
Designing and Implementing a Microsoft Azure AI Solution	Detect, analyze, and recognize faces	Occlusion
Designing and Implementing a Microsoft Azure AI Solution	Read Text in Images and Documents with the Azure AI Vision Service	Only total content and pages of text
Designing and Implementing a Microsoft Azure AI Solution	Read Text in Images and Documents with the Azure AI Vision Service	Pages, words and lines of text.
Designing and Implementing a Microsoft Azure AI Solution	Read Text in Images and Documents with the Azure AI Vision Service	Total content, pages, words and line
Designing and Implementing a Microsoft Azure AI Solution	Analyze video	Use the Azure AI Vision service to ex
Designing and Implementing a Microsoft Azure AI Solution	Analyze video	Upload the video to Azure Video Ind
Designing and Implementing a Microsoft Azure AI Solution	Analyze video	Store the video file in an Azure blob
Designing and Implementing a Microsoft Azure AI Solution	Analyze text with Azure AI Language	Use the Azure AI Language service to
Designing and Implementing a	Analyze text with Azure AI Language	Use the Azure AI Language service to

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Analyze text with Azure AI Language	Use the Azure AI Language service to
Designing and Implementing a Microsoft Azure AI Solution	Build a question answering solution	Create an empty knowledge base an
Designing and Implementing a Microsoft Azure AI Solution	Build a question answering solution	Create a new knowledge base, impo
Designing and Implementing a Microsoft Azure AI Solution	Build a question answering solution	"Create a new knowledge base, sele
Designing and Implementing a Microsoft Azure AI Solution	Build a conversational language understanding model	Intents
Designing and Implementing a Microsoft Azure AI Solution	Build a conversational language understanding model	Utterances
Designing and Implementing a Microsoft Azure AI Solution	Build a conversational language understanding model	Entities
Designing and Implementing a Microsoft Azure AI Solution	Develop an app with Azure AI Language	Sentiment analysis
Designing and Implementing a Microsoft Azure AI Solution	Develop an app with Azure AI Language	Key phrase extraction
Designing and Implementing a Microsoft Azure AI Solution	Develop an app with Azure AI Language	Entity recognition
Designing and Implementing a Microsoft Azure AI Solution	Create a custom text classification solution	A single label classification project
Designing and Implementing a Microsoft Azure AI Solution	Create a custom text classification solution	A multiple label classification projec
Designing and Implementing a Microsoft Azure AI Solution	Create a custom text classification solution	A varied label classification project
Designing and Implementing a Microsoft Azure AI Solution	Create a custom named entity extraction solution	Recall
Designing and Implementing a Microsoft Azure AI Solution	Create a custom named entity extraction solution	Precision
Designing and Implementing a Microsoft Azure AI Solution	Create a custom named entity extraction solution	F1 score
Designing and Implementing a Microsoft Azure AI Solution	Translate text with the Azure AI Translator service	Detect
Designing and Implementing a	Translate text with the Azure AI Translator	Translate

Microsoft Azure AI Solution	service	
Designing and Implementing a Microsoft Azure AI Solution	Translate text with the Azure AI Translator service	Transliterate
Designing and Implementing a Microsoft Azure AI Solution	Create speech-enabled apps with Azure AI services	The location and one of the keys
Designing and Implementing a Microsoft Azure AI Solution	Create speech-enabled apps with Azure AI services	The primary and secondary keys
Designing and Implementing a Microsoft Azure AI Solution	Create speech-enabled apps with Azure AI services	The endpoint and one of the keys
Designing and Implementing a Microsoft Azure AI Solution	Translate speech with the Azure AI Speech service	SpeechConfig
Designing and Implementing a Microsoft Azure AI Solution	Translate speech with the Azure AI Speech service	SpeechTranslationConfig
Designing and Implementing a Microsoft Azure AI Solution	Translate speech with the Azure AI Speech service	AudioConfig
Designing and Implementing a Microsoft Azure AI Solution	Create an Azure Cognitive Search solution	Add a JSON file that defines an Azur
Designing and Implementing a Microsoft Azure AI Solution	Create an Azure Cognitive Search solution	Enable anonymous access for the bl
Designing and Implementing a Microsoft Azure AI Solution	Create an Azure Cognitive Search solution	In an Azure AI Services resource, an where the files are stored.
Designing and Implementing a Microsoft Azure AI Solution	Create a custom skill for Azure Cognitive Search	Create a custom skill that uses an Az sentiment for a document.
Designing and Implementing a Microsoft Azure AI Solution	Create a custom skill for Azure Cognitive Search	Create a custom skill that calls the A of each document.
Designing and Implementing a Microsoft Azure AI Solution	Create a custom skill for Azure Cognitive Search	Add the built-in Sentiment skill to th
Designing and Implementing a Microsoft Azure AI Solution	Create a knowledge store with Azure Cognitive Search	Merge
Designing and Implementing a Microsoft Azure AI Solution	Create a knowledge store with Azure Cognitive Search	Shaper
Designing and Implementing a Microsoft Azure AI Solution	Create a knowledge store with Azure Cognitive Search	Split
Designing and Implementing a Microsoft Azure AI Solution	Enrich a search index using Language Studio	Conversational language understand
Designing and Implementing a	Enrich a search index using Language Studio	Analyze sentiment.

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Enrich a search index using Language Studio	Custom text classification.
Designing and Implementing a Microsoft Azure AI Solution	Implement advanced search features in Azure Cognitive Search	+
Designing and Implementing a Microsoft Azure AI Solution	Implement advanced search features in Azure Cognitive Search	^
Designing and Implementing a Microsoft Azure AI Solution	Implement advanced search features in Azure Cognitive Search	!
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure Machine Learning custom skill for Azure Cognitive Search	Real-time endpoint
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure Machine Learning custom skill for Azure Cognitive Search	Web service
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure Machine Learning custom skill for Azure Cognitive Search	Batch endpoint
Designing and Implementing a Microsoft Azure AI Solution	Search data outside the Azure platform in Azure Cognitive Search using Azure Data Factory	You can only upload one document a
Designing and Implementing a Microsoft Azure AI Solution	Search data outside the Azure platform in Azure Cognitive Search using Azure Data Factory	The JSON can't contain complex data
Designing and Implementing a Microsoft Azure AI Solution	Search data outside the Azure platform in Azure Cognitive Search using Azure Data Factory	You have to define the index in the A
Designing and Implementing a Microsoft Azure AI Solution	Maintain an Azure Cognitive Search Solution	Create an Azure Cognitive Search se least two replicas.
Designing and Implementing a Microsoft Azure AI Solution	Maintain an Azure Cognitive Search Solution	Create an Azure Cognitive Search se three replicas.
Designing and Implementing a Microsoft Azure AI Solution	Maintain an Azure Cognitive Search Solution	Create an Azure Cognitive Search se replica.
Designing and Implementing a Microsoft Azure AI Solution	Use semantic search to get better search results in Azure Cognitive Search	Up to 50.
Designing and Implementing a Microsoft Azure AI Solution	Use semantic search to get better search results in Azure Cognitive Search	As many results as the BM25 ranking
Designing and Implementing a Microsoft Azure AI Solution	Use semantic search to get better search results in Azure Cognitive Search	Up to 25.
Designing and Implementing a Microsoft Azure AI Solution	Improve search results using vector search in Azure Cognitive Search	To create a search to match text inp
Designing and Implementing a	Improve search results using vector search in	When you need to find matches acro

Microsoft Azure AI Solution	Azure Cognitive Search	
Designing and Implementing a Microsoft Azure AI Solution	Improve search results using vector search in Azure Cognitive Search	To upload and index a document libr
Designing and Implementing a Microsoft Azure AI Solution	Plan an Azure AI Document Intelligence solution	A Read model.
Designing and Implementing a Microsoft Azure AI Solution	Plan an Azure AI Document Intelligence solution	A Layout model.
Designing and Implementing a Microsoft Azure AI Solution	Plan an Azure AI Document Intelligence solution	A Composed model.
Designing and Implementing a Microsoft Azure AI Solution	Use prebuilt Azure AI Document Intelligence models	Read model.
Designing and Implementing a Microsoft Azure AI Solution	Use prebuilt Azure AI Document Intelligence models	General document model.
Designing and Implementing a Microsoft Azure AI Solution	Use prebuilt Azure AI Document Intelligence models	ID document model.
Designing and Implementing a Microsoft Azure AI Solution	Extract data from forms with Azure Document Intelligence	Train Model and Get Model Labels
Designing and Implementing a Microsoft Azure AI Solution	Extract data from forms with Azure Document Intelligence	Analyze Invoice and Get Analyze Invo
Designing and Implementing a Microsoft Azure AI Solution	Extract data from forms with Azure Document Intelligence	Create Azure Document Intelligence
Designing and Implementing a Microsoft Azure AI Solution	Create a composed Form Recognizer model	modelId
Designing and Implementing a Microsoft Azure AI Solution	Create a composed Form Recognizer model	status
Designing and Implementing a Microsoft Azure AI Solution	Create a composed Form Recognizer model	docType
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure AI Document Intelligence custom skill for Azure Cognitive Search	formUrl
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure AI Document Intelligence custom skill for Azure Cognitive Search	recordId
Designing and Implementing a Microsoft Azure AI Solution	Build an Azure AI Document Intelligence custom skill for Azure Cognitive Search	formSasToken
Designing and Implementing a Microsoft Azure AI Solution	Get started with Azure OpenAI Service	text-davinci-003
Designing and Implementing a	Get started with Azure OpenAI Service	gpt-35-turbo

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Get started with Azure OpenAI Service	text-embedding-ada-002 (Version 2)
Designing and Implementing a Microsoft Azure AI Solution	Build natural language solutions with Azure OpenAI Service	Chat, Embedding, and Completion
Designing and Implementing a Microsoft Azure AI Solution	Build natural language solutions with Azure OpenAI Service	Key, Endpoint, and Deployment nam
Designing and Implementing a Microsoft Azure AI Solution	Build natural language solutions with Azure OpenAI Service	Summary, Deployment name, and E
Designing and Implementing a Microsoft Azure AI Solution	Apply prompt engineering with Azure OpenAI Service	By using complex instructions that a
Designing and Implementing a Microsoft Azure AI Solution	Apply prompt engineering with Azure OpenAI Service	By providing clear and descriptive in
Designing and Implementing a Microsoft Azure AI Solution	Apply prompt engineering with Azure OpenAI Service	By using vague prompts
Designing and Implementing a Microsoft Azure AI Solution	Generate code with Azure OpenAI Service	Increase in efficiency and productivi
Designing and Implementing a Microsoft Azure AI Solution	Generate code with Azure OpenAI Service	Increase in bugs and readability
Designing and Implementing a Microsoft Azure AI Solution	Generate code with Azure OpenAI Service	Increase in time spent coding
Designing and Implementing a Microsoft Azure AI Solution	Generate images with Azure OpenAI Service	DALL-E
Designing and Implementing a Microsoft Azure AI Solution	Generate images with Azure OpenAI Service	GPT-35-Turbo
Designing and Implementing a Microsoft Azure AI Solution	Generate images with Azure OpenAI Service	Text-Davinci
Designing and Implementing a Microsoft Azure AI Solution	Use your own data with Azure OpenAI Service	Create their own AI chat models
Designing and Implementing a Microsoft Azure AI Solution	Use your own data with Azure OpenAI Service	Access Azure OpenAI without an app
Designing and Implementing a Microsoft Azure AI Solution	Use your own data with Azure OpenAI Service	Use supported AI chat models that c
Designing and Implementing a Microsoft Azure AI Solution	Fundamentals of Responsible Generative AI	To make a legal case that indemnifie solution.
Designing and Implementing a	Fundamentals of Responsible Generative AI	To document the purpose, expected

Microsoft Azure AI Solution		
Designing and Implementing a Microsoft Azure AI Solution	Fundamentals of Responsible Generative AI	To evaluate the cost of cloud service

Azure VMware Solution (AVS) | Microsoft Partner - Mar 4, 2025 - 1:22:59 PM		
Your overall results	Excellent	'6/6'
AVS | Readiness Resources	Excellent	'8/10'
AVS | Marketplace Offer Development Resources	Excellent	'3/3'
AVS | Specialization Resources	Excellent	'4/4'
AVS | Cosell Acceleration Resources	Excellent	'9/9'
Category	Link-Text	Link
AVS | Readiness Resources	Introduction	https://learn.microso
AVS | Readiness Resources	Learning Resources	https://aka.ms/AVSLe

AVS | Readiness Resources	Learning Path	https://aka.ms/AVSLe
AVS | Readiness Resources	Overview Video	https://aka.ms/AVSW
AVS | Readiness Resources	AVS Academy	https://aka.ms/AVSAc
AVS | Readiness Resources	VMware for Azure VMware Solution Master Specialist Exam	https://aka.ms/AVSEx
AVS | Readiness Resources	VMware TechZone	https://aka.ms/AVSTe
AVS | Readiness Resources	Landing Zone Accelerator	https://aka.ms/AVSLZ
AVS | Readiness Resources	Landing Zone Accelerator GitHub Repository	https://aka.ms/AVSLZ
AVS | Readiness Resources	Landing Zone Assessment Review	https://aka.ms/AVSLZ
AVS | Readiness Resources	Landing Zone Assessment Network Design Guide	https://aka.ms/AVSNI
AVS | Readiness Resources	Deployment Checklist	https://aka.ms/AVSCh
AVS | Readiness Resources	Azure Well-Architected Assessment for AVS	https://aka.ms/AVSW
AVS | Readiness Resources	Azure Well-Architected Documentation for AVS	https://aka.ms/AVSW
AVS | Readiness Resources	Azure Proactive Resiliency Library for AVS	https://aka.ms/AVSAF
AVS | Readiness Resources	AVS Updates	https://aka.ms/AVSUp
AVS | Readiness Resources	Migrating VMware vSphere workloads to Azure VMware Solution	https://learn.microso vmware/migrate
AVS | Readiness Resources	Extending hybrid and multi-cloud agility	https://learn.microso
AVS | Readiness Resources	High availability and disaster recovery for VMware workloads	https://learn.microso recovery-manager
AVS | Readiness Resources	Azure VMware Solution for Desktop virtualization	https://learn.microso
AVS | Readiness Resources	AVS LAB Automation	https://github.com/az
AVS | Readiness Resources	VMware AVS Hands-on Labs	https://aka.ms/AVSHO
AVS | Readiness Resources	AVS Workshop Lab Guide	https://aka.ms/AVSHu
AVS | Marketplace Offer Development Resources	Sell through the commercial marketplace	https://learn.microso
AVS | Marketplace Offer Development Resources	Plan a Consulting Service Offer, applicable for AVS Service	https://learn.microso
AVS | Marketplace Offer Development Resources	Partner Got-To-Market Toolbox	http://aka.ms/gtmtoo
AVS | Specialization Resources	Specialization Overview	https://aka.ms/AVSSp

AVS | Specialization Resources	Specialization Video	https://aka.ms/AVSAc
AVS | Specialization Resources	Specialization Audit Checklist	https://aka.ms/AVSAc
AVS | Specialization Resources	Specialization Assessment	https://aka.ms/AVSAc
AVS | Cosell Acceleration Resources	AVS Customer Story	https://aka.ms/AVSCu
AVS | Cosell Acceleration Resources	IDC white paper: The Business Value of Azure VMware Solution	https://aka.ms/AVSID
AVS | Cosell Acceleration Resources	Digital Marketing Campaign (On Demand)	https://aka.ms/AVSDI
AVS | Cosell Acceleration Resources	AVS Pricing Reference	https://aka.ms/AVSPr
AVS | Cosell Acceleration Resources	AVS Go Big for Partners	https://aka.ms/AVSPa
AVS | Cosell Acceleration Resources	AVS Partner Assets Collection	https://aka.ms/AVSPa
AVS | Cosell Acceleration Resources	AVS Pros (LinkedIn Group)	https://aka.ms/AVSPr
AVS | Cosell Acceleration Resources	Partners Incentives and Programs	https://aka.ms/Partne
AVS | Cosell Acceleration Resources	AVS Bootcamp Sales Track	https://aka.ms/avsbo
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Category	Question	Answers
AVS | Readiness Resources	Opportunity and Use Cases	Migrating VMware vS
AVS | Readiness Resources	Opportunity and Use Cases	Extending hybrid and
AVS | Readiness Resources	Opportunity and Use Cases	High availability and d
AVS | Readiness Resources	Opportunity and Use Cases	Desktop virtualization
AVS | Readiness Resources	Opportunity and Use Cases	Azure Migrate and Mo
AVS | Readiness Resources	Training Resources	Introduction
AVS | Readiness Resources	Training Resources	Learning Path
AVS | Readiness Resources	Training Resources	Learning Resources
AVS | Readiness Resources	Training Resources	Overview Video
AVS | Readiness Resources	Training Resources	AVS Academy
AVS | Readiness Resources	Training Resources	VMware TechZone

AVS | Readiness Resources	Training Resources	VMware for Azure VM
AVS | Readiness Resources	Training Resources	AVS LAB Automation
AVS | Readiness Resources	Training Resources	VMware AVS Hands-o
AVS | Readiness Resources	Training Resources	AVS Workshop Lab Gu
AVS | Readiness Resources	Deployment Guidance	Landing Zone Accelera
AVS | Readiness Resources	Deployment Guidance	Landing Zone Accelera
AVS | Readiness Resources	Deployment Guidance	Landing Zone Assessm
AVS | Readiness Resources	Deployment Guidance	Landing Zone Assessm
AVS | Readiness Resources	Deployment Guidance	Deployment Checklist
AVS | Readiness Resources	Deployment Guidance	Azure Well-Architecte
AVS | Readiness Resources	Deployment Guidance	Azure Well-Architecte
AVS | Readiness Resources	Deployment Guidance	Azure Proactive Resili
AVS | Readiness Resources	Deployment Guidance	VMware Workloads A
AVS | Readiness Resources	Deployment Guidance	AVS Updates
AVS | Marketplace Offer Development Resources	Marketplace Training and Support Resources	Sell through the comm
AVS | Marketplace Offer Development Resources	Marketplace Training and Support Resources	Plan a Consulting Serv
AVS | Marketplace Offer Development Resources	Marketplace Training and Support Resources	Partner Got-To-Marke
AVS | Specialization Resources	AVS Specialization details	Specialization Overvie
AVS | Specialization Resources	AVS Specialization details	Specialization Video
AVS | Specialization Resources	AVS Specialization details	Specialization Audit C
AVS | Specialization Resources	AVS Specialization details	Specialization Assessr
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Customer Story
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	IDC white paper: The
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	Digital Marketing Cam

AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Pricing Reference
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Go Big for Partne
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Partner Assets Co
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Pros (LinkedIn Gr
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	Partners Incentives ar
AVS | Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	AVS Bootcamp Sales T

Microsoft Cloud for Sustainability Adoption Guide | Microsoft Partners - Mar 4, 2025 - 12:03:23 PM		

Your overall results	Excellent	'3/3'
Sustainability Readiness Resources	Excellent	'3/4'
Marketplace Offer Development Resources	Excellent	'3/3'
Sustainability Cosell Acceleration Resources	Excellent	'2/2'
Category	Link-Text	Link
Sustainability Readiness Resources	This is AI … for Sustainability	https://info.microsoft
Sustainability Readiness Resources	Microsoft Cloud for Sustainability: ESG and the Future of Business	https://www.linkedin. business
Sustainability Readiness Resources	Microsoft Cloud for Sustainability Training Collection	https://aka.ms/mcfsle
Sustainability Readiness Resources	Pre-sales licenses for Sustainability Manager sandbox Environments for Microsoft Partners	https://experience.dy
Sustainability Readiness Resources	Well-Architected for Microsoft Cloud for Sustainability	https://learn.microsof
Sustainability Readiness Resources	Roadmap: What's new in Microsoft Cloud for Sustainability overview	https://learn.microsof
Sustainability Readiness Resources	Fabric Technical Resources	https://learn.microsof associate/?practice-as
Sustainability Readiness Resources	Microsoft Cloud for Sustainability Technical Summit	https://aka.ms/mcfste
Marketplace Offer Development Resources	Sell Through the Commercial Marketplace	https://learn.microsof
Marketplace Offer Development Resources	Microsoft Commercial Marketplace Publisher FAQ	https://learn.microsof guide
Marketplace Offer Development Resources	Mastering the Marketplace: Office Hours	https://aka.ms/MTMc

Sustainability Cosell Acceleration Resources	Sustainability Marketing Campaigns	https://partner.micros
Sustainability Cosell Acceleration Resources	Recommended Training for Sellers: Get started with Microsoft Cloud for Sustainability	https://learn.microsof
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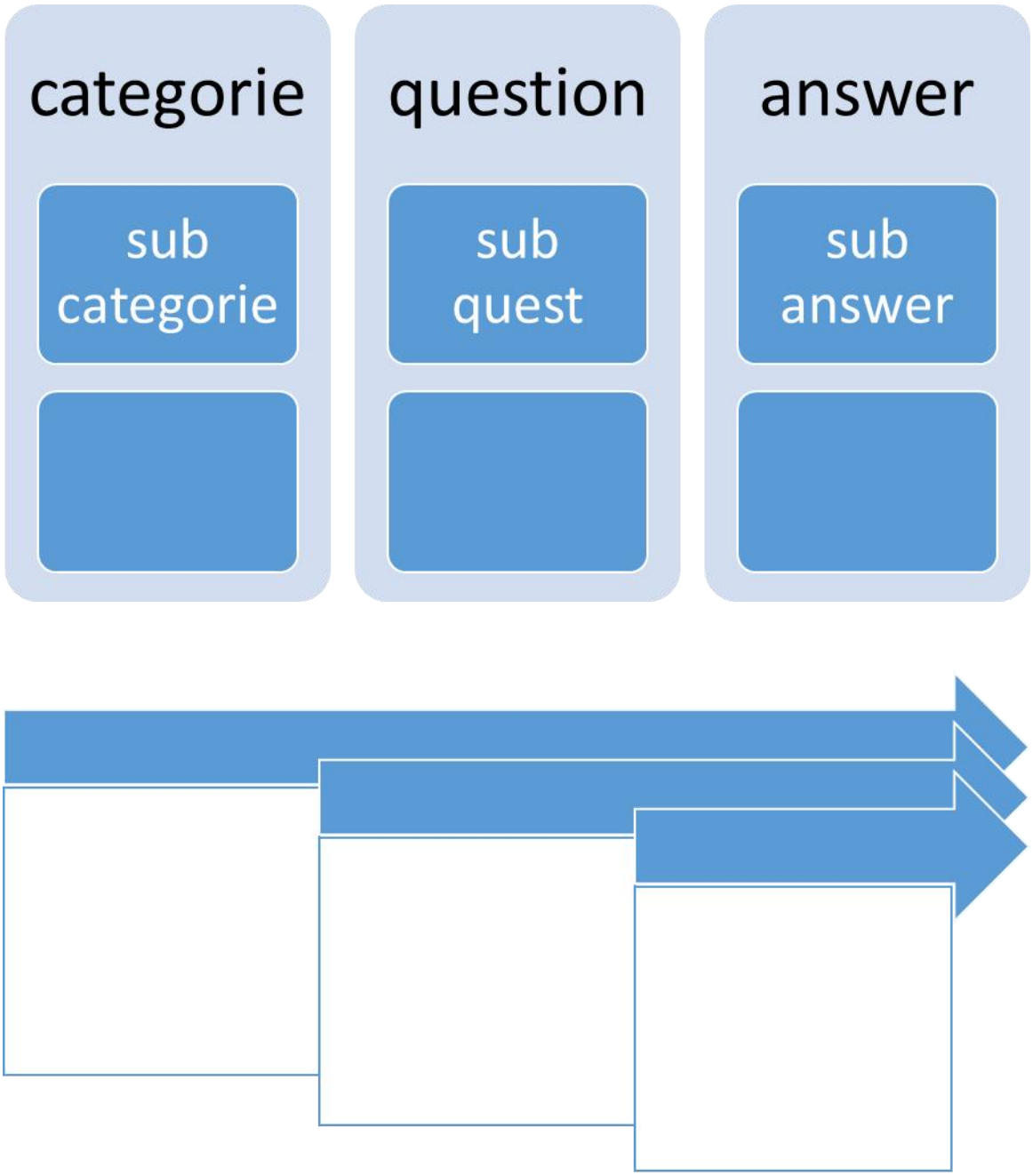
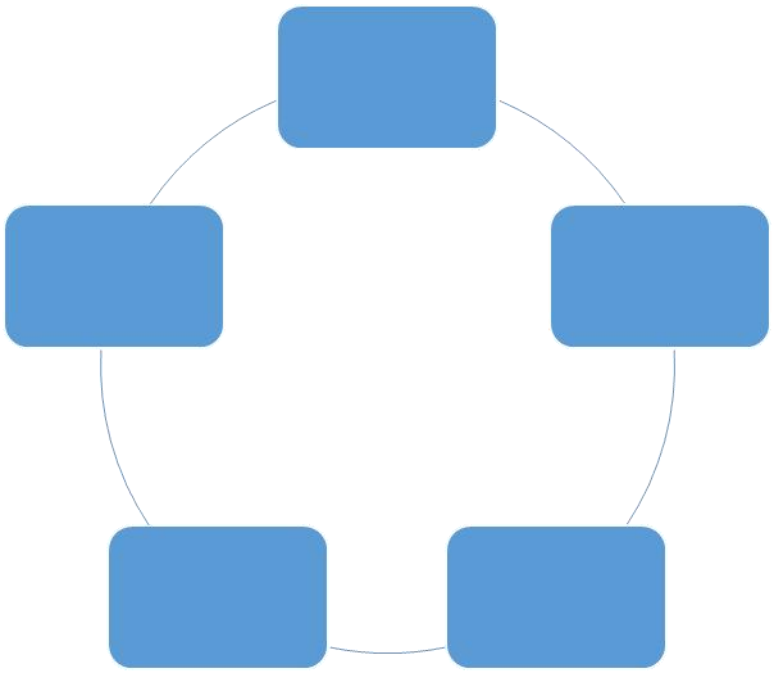
Category	Question	Answers
Sustainability Readiness Resources	Opportunity and Use Cases	This is AI … for Sustain
Sustainability Readiness Resources	Opportunity and Use Cases	Microsoft Cloud for Su
Sustainability Readiness Resources	Training Resources	Microsoft Cloud for Su
Sustainability Readiness Resources	Training Resources	Pre-sales licenses for S
Sustainability Readiness Resources	Training Resources	Fabric Technical Resou
Sustainability Readiness Resources	Training Resources	Microsoft Cloud for Su
Sustainability Readiness Resources	Roadmap and Best Practices	Well-Architected for M
Sustainability Readiness Resources	Roadmap and Best Practices	What's new in Microso
Marketplace Offer Development Resources	Marketplace Training and Support Resources	Sell Through the Comm
Marketplace Offer Development Resources	Marketplace Training and Support Resources	Microsoft Commercial
Marketplace Offer Development Resources	Marketplace Training and Support Resources	Mastering the Market
Sustainability Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	Sustainability Marketi
Sustainability Cosell Acceleration Resources	Go-To-Market Assets & Recommended Sellers Training	Recommended Sellers


categorie
sub categorie
question
sub quest
answer
sub answer



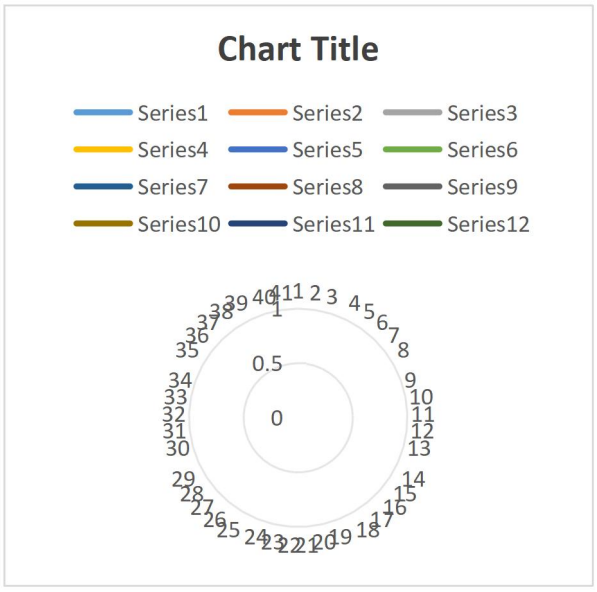


Chart Title
Series1
Series2
Series3
Series4
Series5
Series6
Series7
Series8
Series9
Series10
Series11
Series12
0.5
0

Radar chart ,,

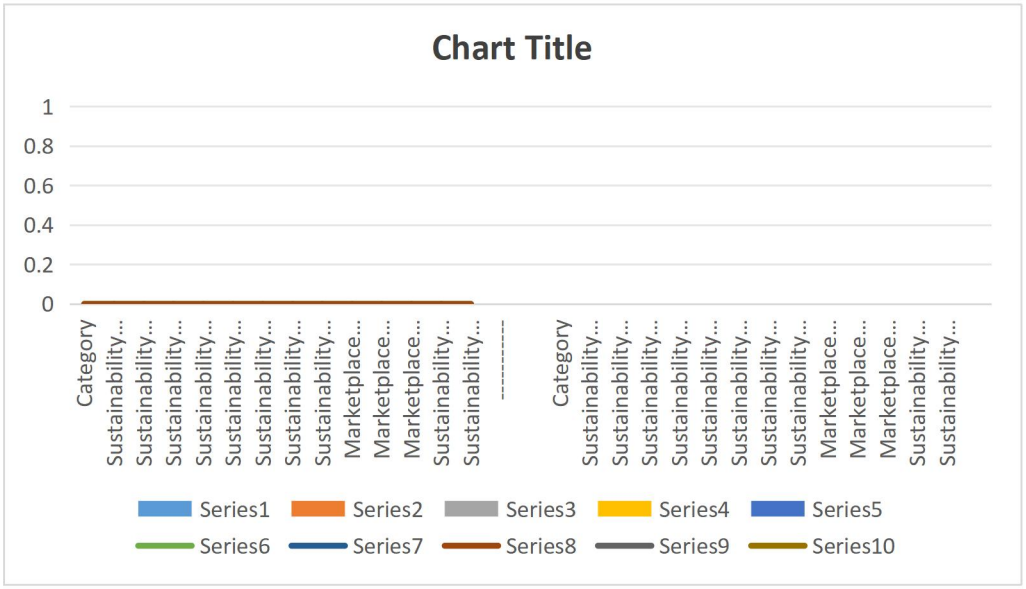


Chart Title
1
0.8
0.6
0.4
0.2
0
Category
Sustainability...
Marketplace...
Series1
Series2
Series3
Series4
Series5
Series6
Series7
Series8
Series9
Series10

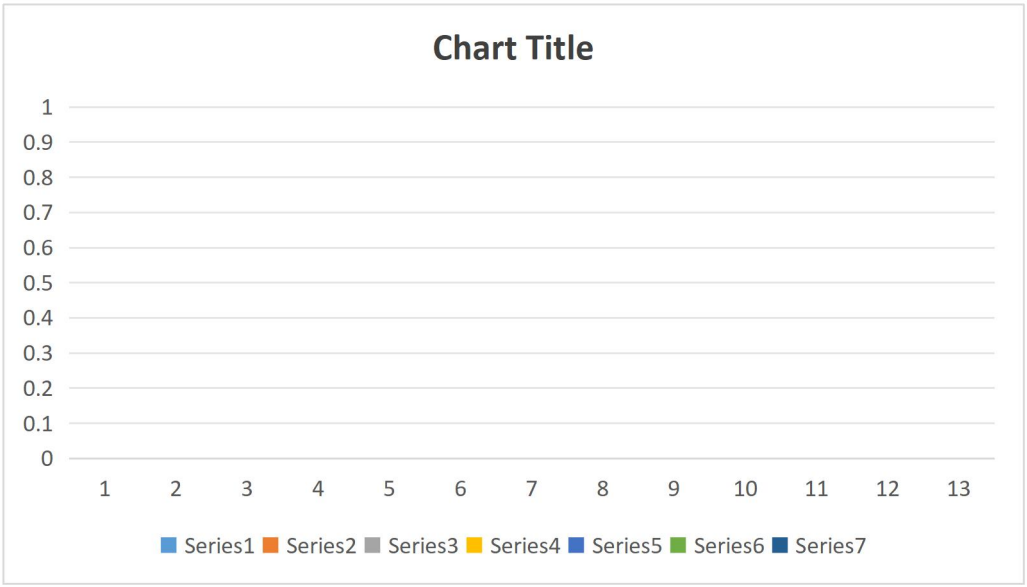


Chart Title
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1 2 3 4 5 6 7 8 9 10 11 12 13
Series1 Series2 Series3 Series4 Series5 Series6 Series7

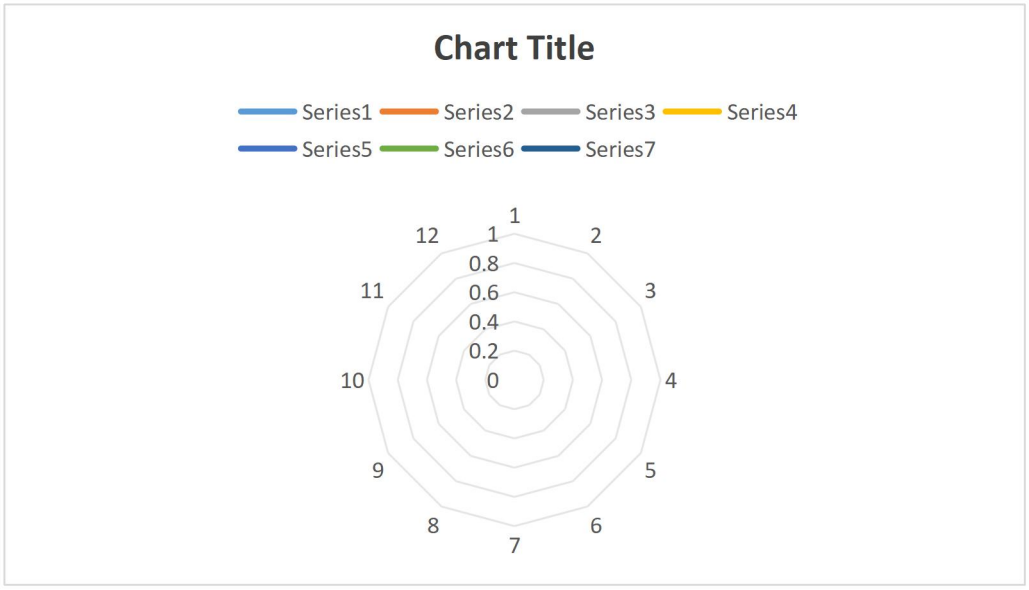


Chart Title
Series1 Series2 Series3 Series4
Series5 Series6 Series7
1
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12
1
0.8
0.6
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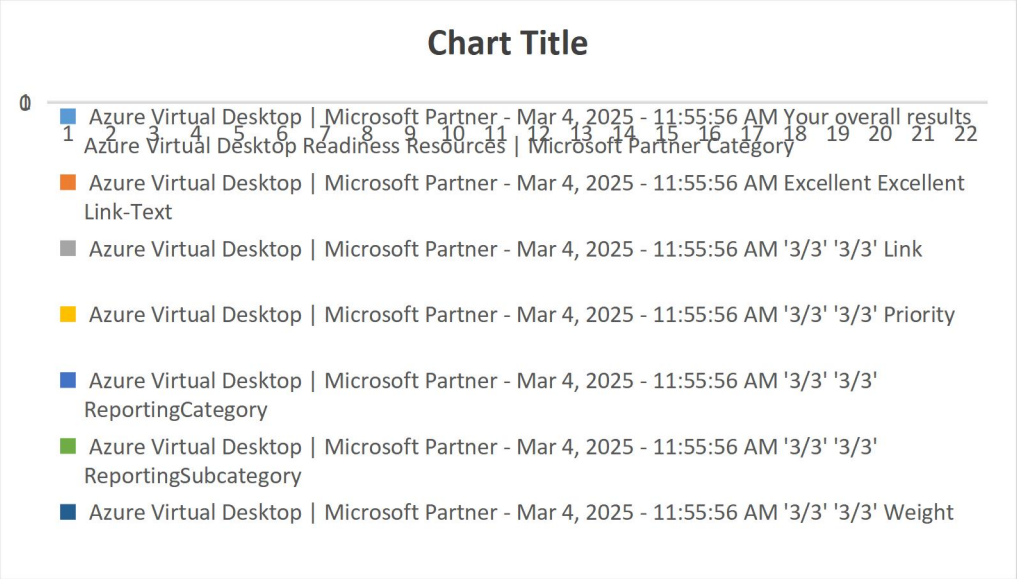
Chart Title
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM Your overall results Azure Virtual Desktop Readiness Resources | Microsoft Partner Category
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM Excellent Excellent Link-Text
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM '3/3' '3/3' Link
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM '3/3' '3/3' Priority
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM '3/3' '3/3' ReportingCategory
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM '3/3' '3/3' ReportingSubcategory
Azure Virtual Desktop | Microsoft Partner - Mar 4, 2025 - 11:55:56 AM '3/3' '3/3' Weight

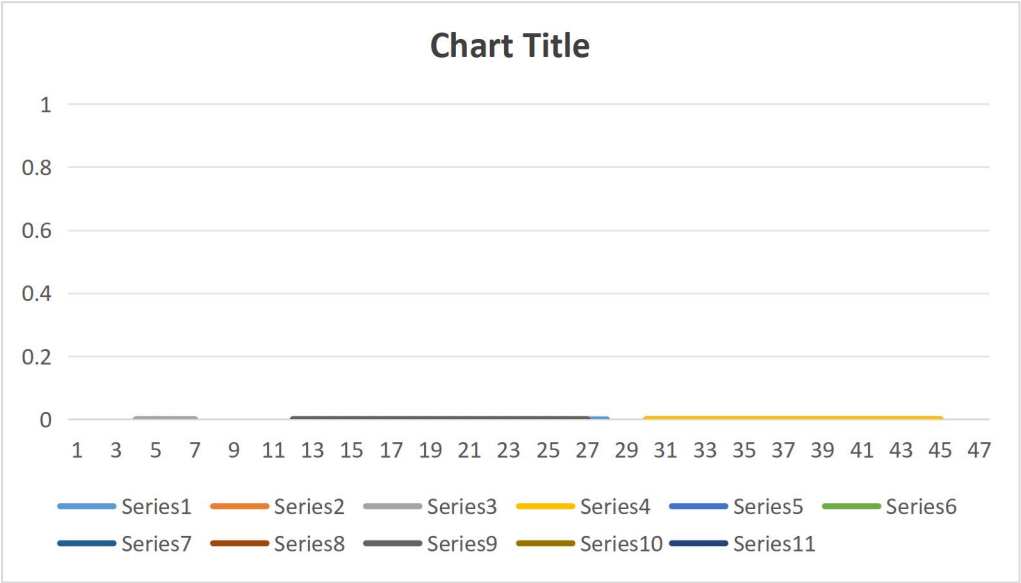
Chart Title
1
0.8
0.6
0.4
0.2
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Series1 Series2 Series3 Series4 Series5 Series6
Series7 Series8 Series9 Series10 Series11

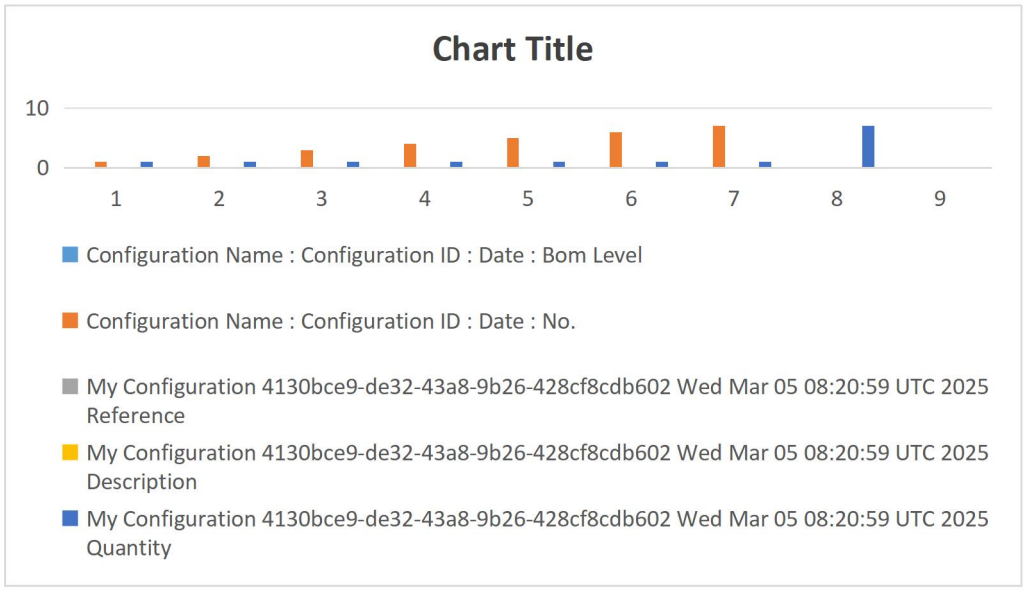
Chart Title
10
0
1
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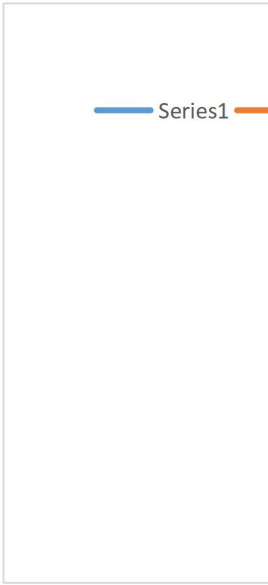
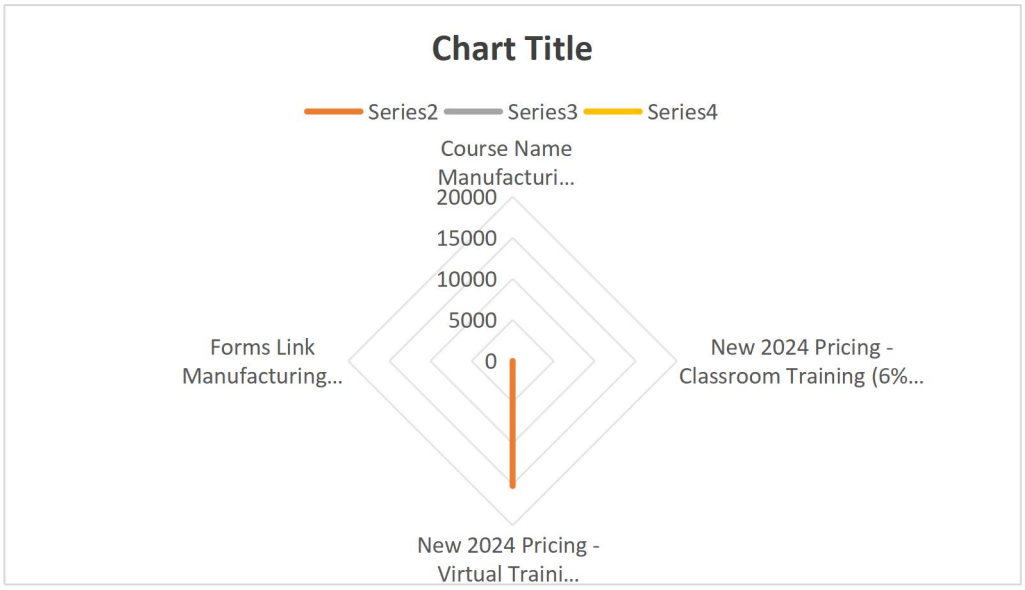
9
Configuration Name : Configuration ID : Date : Bom Level
Configuration Name : Configuration ID : Date : No.
My Configuration 4130bce9-de32-43a8-9b26-428cf8cdb602 Wed Mar 05 08:20:59 UTC 2025 Reference
My Configuration 4130bce9-de32-43a8-9b26-428cf8cdb602 Wed Mar 05 08:20:59 UTC 2025 Description
My Configuration 4130bce9-de32-43a8-9b26-428cf8cdb602 Wed Mar 05 08:20:59 UTC 2025 Quantity


Series1



succeeded Jan 18, 2025 in 18s

6s

Current runner version: '2.321.0'

Operating System

Runner Image

Runner Image Provisioner

GITHUB_TOKEN Permissions

Secret source: Actions

Prepare workflow directory

Prepare all required actions

Getting action download info

Download action repository 'actions/checkout@v2'
(SHA:ee0669bd1cc54295c223e0bb666b733df41de1c5)

Download action repository 'shundor/python-bandit-
scan@9cc5aa4a006482b8a7f91134412df6772dbda22c'
(SHA:9cc5aa4a006482b8a7f91134412df6772dbda22c)

Getting action download info

Download action repository 'actions/upload-artifact@main'
(SHA:65c4c4a1ddee5b72f698fdd19549f0f0fb45cf08)

Download action repository 'github/codeql-action@v2'
(SHA:b8d3b6e8af63cde30bdc382c0bc28114f4346c88)

Complete job name: bandit

1s

Run actions/checkout@v2

Syncing repository: Kananga5/engineering-workbase-tshing-pratical-batch-

Getting Git version info

Temporarily overriding HOME='/home/runner/work/_temp/d097deb1-71b1-46f0-aaeb-f21540e582e1'
before making global git config changes

Adding repository directory to the temporary git global config as a safe directory

/usr/bin/git config --global --add safe.directory /home/runner/work/engineering-workbase-tshing-

to me, tshigombekb

Current runner version: '2.322.0'
Operating System
Runner Image
Runner Image Provisioner
GITHUB_TOKEN Permissions
Secret source: Actions
Prepare workflow directory
Prepare all required actions
Getting action download info
Download action repository 'actions/checkout@v4' (SHA:11bd71901bbe5b1630ceea73d27597364c9af683)
Complete job name: build
14s
Run actions/checkout@v4
Syncing repository: Kananga5/experimental-career-work-master-thesis-atlantic-

Getting Git version info
Temporarily overriding HOME='/home/runner/work/_temp/fdd2df08-9e8d-4ede-b2e5-a892571defff' before making global git config changes
Adding repository directory to the temporary git global config as a safe directory
/usr/bin/git config --global --add safe.directory /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-
Deleting the contents of '/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-'
Initializing the repository
Disabling automatic garbage collection
Setting up auth
Fetching the repository
Determining the checkout info
/usr/bin/git sparse-checkout disable
/usr/bin/git config --local --unset-all extensions.worktreeConfig
Checking out the ref
/usr/bin/git log -1 --format=%H
b341f5d76b3e7dcd2bb10edc91a6af2874152e10
0s
Run echo Hello, world!
Hello, world!
0s
Run echo Add other actions to build,
Add other actions to build,
test, and deploy your project.
0s
Post job cleanup.
/usr/bin/git version
git version 2.48.1
Temporarily overriding HOME='/home/runner/work/_temp/f3fc4178-4e0d-420c-9144-a0e1ca56200a' before making global git config changes
Adding repository directory to the temporary git global config as a safe directory
/usr/bin/git config --global --add safe.directory /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-
/usr/bin/git config --local --name-only --get-regexp core\.sshCommand
/usr/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'core\.sshCommand' && git config --local --unset-all 'core.sshCommand' || :"
/usr/bin/git config --local --name-only --get-regexp http\.https\:\/\/github\.com\/\.extraheader
http.https://github.com/.extraheader
/usr/bin/git config --local --unset-all http.https://github.com/.extraheader
/usr/bin/git submodule foreach --recursive sh -c "git config --local --name-only --get-regexp 'http\.https\:\/\/github\.com\/\.extraheader' && git config --local --unset-all 'http.https://github.com/.extraheader' || :"
0s
Cleaning up orphan processes

engineering security management system #4

-

Codacy Security Scan
succeeded Feb 27, 2025 in 48s

7s
Current runner version: '2.322.0'
Operating System
Runner Image
Runner Image Provisioner
GITHUB_TOKEN Permissions
Secret source: Actions
Prepare workflow directory
Prepare all required actions
Getting action download info
Download action repository 'actions/checkout@v4' (SHA:11bd71901bbe5b1630ceea73d27597364c9af683)
Download action repository 'codacy/codacy-analysis-cli-action@d840f886c4bd4edc059706d09c6a1586111c540b' (SHA:d840f886c4bd4edc059706d09c6a1586111c540b)
Download action repository 'github/codeql-action@v3' (SHA:b56ba49b26e50535fa1e7f7db0f4f7b4bf65d80d)
Complete job name: Codacy Security Scan
9s
Run actions/checkout@v4
Syncing repository: Kananga5/experimental-career-work-master-thesis-atlantic-
Getting Git version info
Temporarily overriding HOME='/home/runner/work/_temp/6b755638-a1a8-4eb6-9f5c-3f900b44407b' before making global git config changes
Adding repository directory to the temporary git global config as a safe directory
/usr/bin/git config --global --add safe.directory /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-
Deleting the contents of '/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-'
Initializing the repository
Disabling automatic garbage collection
Setting up auth
Fetching the repository
Determining the checkout info
/usr/bin/git sparse-checkout disable
/usr/bin/git config --local --unset-all extensions.worktreeConfig
Checking out the ref
/usr/bin/git log -1 --format=%H
b341f5d76b3e7dcd2bb10edc91a6af2874152e10
22s
Run codacy/codacy-analysis-cli-action@d840f886c4bd4edc059706d09c6a1586111c540b
Run echo "CODACY_ANALYSIS_CLI_VERSION=4.0.0" >> $GITHUB_ENV
Run echo "CLI_SCRIPT_PATH=/home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh" >> $GITHUB_ENV
Run wget -O - https://raw.githubusercontent.com/codacy/codacy-analysis-cli/4.0.0/bin/codacy-analysis-cli.sh > /home/runner/work/_actions/codacy/codacy-analysis-cli-

action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh
--2025-02-27 12:18:34-- https://raw.githubusercontent.com/codacy/codacy-analysis-cli/4.0.0/bin/codacy-analysis-cli.sh
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.110.133, 185.199.109.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3107 (3.0K) [text/plain]
Saving to: 'STDOUT'
0K ... 100% 44.0M=0s
2025-02-27 12:18:34 (44.0 MB/s) - written to stdout [3107/3107]
Run chmod +x /home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh
Run /home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh analyze $(if [true = true]; then echo "--verbose"; fi) $(if [ ]; then echo "--project-token "; fi) $(if [ ]; then echo "--codacy-api-base-url "; fi) $(if [sarif]; then echo "--format sarif"; fi) $(if [results.sarif]; then echo "--output results.sarif"; fi) $(if [ ]; then echo "--directory "; fi) $(if [ ]; then echo "--parallel "; fi) $(if [2147483647]; then echo "--max-allowed-issues 2147483647"; fi) $(if [ ]; then echo "--tool "; fi) $(if [ ]; then echo "--tool-timeout "; fi) $(if [= true]; then echo "--upload"; fi) $(if [= true]; then echo "--fail-if-incomplete"; fi) $(if [= true]; then echo "--allow-network"; fi) $(if [= true]; then echo "--force-file-permissions"; fi) $(if [true = true]; then echo "--gh-code-scanning-compat"; fi)
/home/runner/work/_temp/9f968dbd-ee66-48cc-aff8-4edbbb3128b3.sh: line 1: [: =: unary operator expected
/home/runner/work/_temp/9f968dbd-ee66-48cc-aff8-4edbbb3128b3.sh: line 1: [: =: unary operator expected
/home/runner/work/_temp/9f968dbd-ee66-48cc-aff8-4edbbb3128b3.sh: line 1: [: =: unary operator expected
/home/runner/work/_temp/9f968dbd-ee66-48cc-aff8-4edbbb3128b3.sh: line 1: [: =: unary operator expected
Unable to find image 'codacy/codacy-analysis-cli:4.0.0' locally
4.0.0: Pulling from codacy/codacy-analysis-cli
e7c96db7181b: Pulling fs layer
f910a506b6cb: Pulling fs layer
b6abafe80f63: Pulling fs layer
1811036e9141: Pulling fs layer
6314bc44cdf3: Pulling fs layer
8eac012f9da4: Pulling fs layer
6314bc44cdf3: Waiting
1811036e9141: Waiting
8eac012f9da4: Waiting
f910a506b6cb: Verifying Checksum
f910a506b6cb: Download complete
e7c96db7181b: Verifying Checksum
e7c96db7181b: Download complete
e7c96db7181b: Pull complete
6314bc44cdf3: Verifying Checksum
6314bc44cdf3: Download complete
b6abafe80f63: Verifying Checksum
b6abafe80f63: Download complete
f910a506b6cb: Pull complete
1811036e9141: Verifying Checksum
1811036e9141: Download complete

8eac012f9da4: Verifying Checksum
8eac012f9da4: Download complete
b6abafe80f63: Pull complete
1811036e9141: Pull complete
6314bc44cdf3: Pull complete
8eac012f9da4: Pull complete
Digest: sha256:4e563da124426918287e6ca75e80396264f4304b4a971c601099029bf89f9bcb
Status: Downloaded newer image for codacy/codacy-analysis-cli:4.0.0
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.984000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.890000000, lastModified=2025-02-27 12:18:41.000000000, delta=890000000 ns, racy<=1251250000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:41 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.993000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.993000000, lastModified=2025-02-27 12:18:41.000000000, delta=993000000 ns, racy<=1251250000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.994000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.993000000, lastModified=2025-02-27 12:18:41.000000000, delta=993000000 ns, racy<=1251250000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:41 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.995000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.995000000, lastModified=2025-02-27 12:18:41.000000000, delta=995000000 ns, racy<=1251250000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:41.994000000, lastModified=2025-02-27 12:18:34.000000000, delta=7994000000 ns, racy<=2500000000 ns

02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:41.997000000, lastModified=2025-02-27 12:18:34.000000000, size=3364, fileKey=(dev=801,ino=795413)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.998000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.995000000, lastModified=2025-02-27 12:18:41.000000000, delta=995000000 ns, racy<=1251250000 ns
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:41 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:41 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:41.999000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.999000000, lastModified=2025-02-27 12:18:41.000000000, delta=999000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:41.999000000, lastModified=2025-02-27 12:18:41.000000000, delta=999000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.002000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.002000000, lastModified=2025-02-27 12:18:41.000000000, delta=1002000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:42.003000000, lastModified=2025-02-27 12:18:34.000000000, size=3364, fileKey=(dev=801,ino=795413)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.002000000, lastModified=2025-02-27 12:18:41.000000000, delta=1002000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.012000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.012000000, lastModified=2025-02-27 12:18:41.000000000, delta=1012000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.012000000, lastModified=2025-02-27 12:18:41.000000000, delta=1012000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.017000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.017000000, lastModified=2025-02-27 12:18:41.000000000, delta=1017000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.017000000, lastModified=2025-02-27 12:18:41.000000000, delta=1017000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.027000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.027000000, lastModified=2025-02-27 12:18:41.000000000, delta=1027000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, create new FileSnapshot: lastRead=2025-02-27 12:18:42.029000000, lastModified=2025-02-27 12:18:34.000000000, size=21, fileKey=(dev=801,ino=795450)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, create new FileSnapshot: lastRead=2025-02-27 12:18:42.030000000, lastModified=2025-02-27 12:18:34.000000000, size=41, fileKey=(dev=801,ino=795447)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.027000000, lastModified=2025-02-27 12:18:41.000000000, delta=1027000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.031000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.031000000, lastModified=2025-02-27 12:18:41.000000000, delta=1031000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-27 12:18:42.029000000, lastModified=2025-02-27 12:18:34.000000000, delta=8029000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-27 12:18:42.030000000, lastModified=2025-02-27 12:18:34.000000000, delta=8030000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 4096 bytes
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, create new FileSnapshot: lastRead=2025-02-27 12:18:42.034000000, lastModified=2025-02-27 12:18:26.000000000, size=4096, fileKey=(dev=801,ino=795223)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-27 12:18:42.034000000, lastModified=2025-02-27 12:18:26.000000000, delta=16034000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 41 bytes
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, create new FileSnapshot: lastRead=2025-02-27 12:18:42.036000000, lastModified=2025-02-27 12:18:27.000000000, size=41, fileKey=(dev=801,ino=795156)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-27 12:18:42.034000000, lastModified=2025-02-27 12:18:26.000000000, delta=16034000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:42.039000000, lastModified=2025-02-27 12:18:34.000000000, size=3364, fileKey=(dev=801,ino=795413)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:42.042000000, lastModified=2025-02-27 12:18:34.000000000, size=3364, fileKey=(dev=801,ino=795413)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.031000000, lastModified=2025-02-27 12:18:41.000000000, delta=1031000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.044000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.044000000, lastModified=2025-02-27 12:18:41.000000000, delta=1044000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-27 12:18:42.034000000, lastModified=2025-02-27 12:18:26.000000000, delta=16034000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.044000000, lastModified=2025-02-27 12:18:41.000000000, delta=1044000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.054000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.054000000, lastModified=2025-02-27 12:18:41.000000000, delta=1054000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
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02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.063000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.063000000, lastModified=2025-02-27 12:18:41.000000000, delta=1063000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=true, read=2025-02-27 12:18:42.063000000, lastModified=2025-02-27 12:18:41.000000000, delta=1063000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:564 - file=/root/.config/jgit/config.lock, is racily clean
02/27 12:18:42 DEBUG o.e.jgit.util.SystemReader:432 - loading config FileBasedConfig[/root/.config/jgit/config]
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/root/.config/jgit/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.710000000, lastModified=2025-02-27 12:18:41.000000000, size=131, fileKey=(dev=2e,ino=4475043)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.config/jgit/config.lock, isRacyClean=false, read=2025-02-27 12:18:42.710000000, lastModified=2025-02-27 12:18:41.000000000, delta=1710000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 WARN c.c.a.c.command.AnalyseCommand:105 - There are uncommitted changes in the project. Please commit them before running your analysis:
Uncommited files:
results.sarif

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-27 12:18:42.029000000, lastModified=2025-02-27 12:18:34.000000000, delta=8029000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-27 12:18:42.030000000, lastModified=2025-02-27 12:18:34.000000000, delta=8030000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.000000000, lastModified=2025-02-27 12:18:34.000000000, delta=8000000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-27 12:18:42.029000000, lastModified=2025-02-27 12:18:34.000000000, delta=8029000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-27 12:18:42.030000000, lastModified=2025-02-27 12:18:34.000000000, delta=8030000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, isRacyClean=false, read=2025-02-27 12:18:42.036000000, lastModified=2025-02-27 12:18:27.000000000, delta=15036000000 ns, racy<=1251250000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.730000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.731000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-27 12:18:41.357000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740658721357000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-27 12:18:42.731000000, lastModified=2025-02-27 12:18:34.000000000, delta=8731000000 ns, racy<=2500000000 ns
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:42.733000000, lastModified=2025-02-27 12:18:34.000000000, size=3364, fileKey=(dev=801,ino=795413)
02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-27 12:18:42.733000000, lastModified=2025-02-27 12:18:34.000000000, size=454, fileKey=(dev=801,ino=795414)
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02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/27 12:18:42 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-27 12:18:42.736000000, lastModified=2025-02-27 12:18:34.00000000
...

to **tshigombekb**, me

-
-
- Settings

Codacy Security Scan

Create mdbook.ymleng **#3**

-

Codacy Security Scan

succeeded Feb 25, 2025 in 47s

8s

Current runner version: '2.322.0'

Operating System

Runner Image

Runner Image Provisioner

GITHUB_TOKEN Permissions

Secret source: Actions

Prepare workflow directory

Prepare all required actions

Getting action download info

Download action repository 'actions/checkout@v4' (SHA:11bd71901bbe5b1630ceea73d27597364c9af683)

Download action repository 'codacy/codacy-analysis-cli-action@d840f886c4bd4edc059706d09c6a1586111c540b' (SHA:d840f886c4bd4edc059706d09c6a1586111c540b)

Download action repository 'github/codeql-action@v3' (SHA:b56ba49b26e50535fa1e7f7db0f4f7b4bf65d80d)

Complete job name: Codacy Security Scan

7s

Run actions/checkout@v4

Syncing repository: Kananga5/experimental-career-work-master-thesis-atlantic-

Getting Git version info

Temporarily overriding HOME='/home/runner/work/_temp/5b297f60-bc05-491c-946b-09bd3e93526d' before making global git config changes

Adding repository directory to the temporary git global config as a safe directory

/usr/bin/git config --global --add safe.directory /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-

Deleting the contents of '/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-'

Initializing the repository

Disabling automatic garbage collection

Setting up auth

Fetching the repository

Determining the checkout info

/usr/bin/git sparse-checkout disable

/usr/bin/git config --local --unset-all extensions.worktreeConfig

Checking out the ref

/usr/bin/git log -1 --format=%H

9d4c86672d506a31a6a939fc82f6e638795bdd8e

21s

Run codacy/codacy-analysis-cli-action@d840f886c4bd4edc059706d09c6a1586111c540b

Run echo "CODACY_ANALYSIS_CLI_VERSION=4.0.0" >> $GITHUB_ENV

Run echo "CLI_SCRIPT_PATH=/home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh" >> $GITHUB_ENV

Run wget -O - https://raw.githubusercontent.com/codacy/codacy-analysis-cli/4.0.0/bin/codacy-analysis-cli.sh > /home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh

--2025-02-25 12:52:53-- https://raw.githubusercontent.com/codacy/codacy-analysis-cli/4.0.0/bin/codacy-analysis-cli.sh

Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.111.133, 185.199.108.133,

185.199.109.133, ...

Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.111.133|:443... connected.

HTTP request sent, awaiting response... 200 OK

Length: 3107 (3.0K) [text/plain]

Saving to: 'STDOUT'

0K ... 100% 33.7M=0s

2025-02-25 12:52:53 (33.7 MB/s) - written to stdout [3107/3107]

Run chmod +x /home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh

Run /home/runner/work/_actions/codacy/codacy-analysis-cli-action/d840f886c4bd4edc059706d09c6a1586111c540b/codacy-analysis-cli.sh analyze $(if [true = true]; then echo "--verbose"; fi) $(if [ ]; then echo "--project-token "; fi) $(if [ ]; then echo "--codacy-api-base-url "; fi) $(if [sarif]; then echo "--format sarif"; fi) $(if [results.sarif]; then echo "--output results.sarif"; fi) $(if [ ]; then echo "--directory "; fi) $(if [ ]; then echo "--parallel "; fi) $(if [2147483647]; then echo "--max-allowed-issues 2147483647"; fi) $(if [ ]; then echo "--tool "; fi) $(if [ ]; then echo "--tool-timeout "; fi) $(if [= true]; then echo "--upload"; fi) $(if [= true]; then echo "--fail-if-incomplete"; fi) $(if [= true]; then echo "--allow-network"; fi) $(if [= true]; then echo "--force-file-permissions"; fi) $(if [true = true]; then echo "--gh-code-scanning-compat"; fi)

/home/runner/work/_temp/81e88f3b-575b-4ad9-92c1-87b4fa134142.sh: line 1: [: =: unary operator expected

/home/runner/work/_temp/81e88f3b-575b-4ad9-92c1-87b4fa134142.sh: line 1: [: =: unary operator expected

/home/runner/work/_temp/81e88f3b-575b-4ad9-92c1-87b4fa134142.sh: line 1: [: =: unary operator expected

/home/runner/work/_temp/81e88f3b-575b-4ad9-92c1-87b4fa134142.sh: line 1: [: =: unary operator expected

Unable to find image 'codacy/codacy-analysis-cli:4.0.0' locally

4.0.0: Pulling from codacy/codacy-analysis-cli

e7c96db7181b: Pulling fs layer

f910a506b6cb: Pulling fs layer

b6abafe80f63: Pulling fs layer

1811036e9141: Pulling fs layer

1811036e9141: Waiting

6314bc44cdf3: Pulling fs layer

8eac012f9da4: Pulling fs layer

6314bc44cdf3: Waiting

8eac012f9da4: Waiting

f910a506b6cb: Verifying Checksum

f910a506b6cb: Download complete

e7c96db7181b: Download complete

e7c96db7181b: Pull complete

6314bc44cdf3: Download complete

b6abafe80f63: Verifying Checksum

b6abafe80f63: Download complete

f910a506b6cb: Pull complete

1811036e9141: Verifying Checksum

1811036e9141: Download complete

8eac012f9da4: Verifying Checksum

8eac012f9da4: Download complete

b6abafe80f63: Pull complete

1811036e9141: Pull complete

6314bc44cdf3: Pull complete

8eac012f9da4: Pull complete

Digest: sha256:4e563da124426918287e6ca75e80396264f4304b4a971c601099029bf89f9bcb

Status: Downloaded newer image for codacy/codacy-analysis-cli:4.0.0

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:00.393000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:00.401000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.401000000, lastModified=2025-02-25 12:52:52.000000000, delta=8401000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:00.404000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:00.404000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:00.409000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, create new FileSnapshot: lastRead=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, size=21, fileKey=(dev=801,ino=2099805)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, create new FileSnapshot: lastRead=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, size=41, fileKey=(dev=801,ino=2099802)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-25

12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 4096 bytes

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, create new FileSnapshot: lastRead=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, size=4096, fileKey=(dev=801,ino=2099727)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, delta=15435000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 41 bytes

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, create new FileSnapshot: lastRead=2025-02-25 12:53:00.437000000, lastModified=2025-02-25 12:52:46.000000000, size=41, fileKey=(dev=801,ino=2099730)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, delta=15435000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:00.441000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:00.444000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns,

racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, delta=15435000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

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02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, delta=15435000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:00.435000000, lastModified=2025-02-25 12:52:45.000000000, delta=15435000000 ns, racy<=1251250000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:00 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 WARN c.c.a.c.command.AnalyseCommand:105 - There are uncommitted changes in the project.

Please commit them before running your analysis:

Uncommited files:

results.sarif

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:00.406000000, lastModified=2025-02-25 12:52:52.000000000, delta=8406000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-25 12:53:00.431000000, lastModified=2025-02-25 12:52:52.000000000, delta=8431000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, isRacyClean=false, read=2025-02-25 12:53:00.437000000, lastModified=2025-02-25 12:52:46.000000000, delta=14437000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:01.080000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:01.081000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:01.081000000, lastModified=2025-02-25 12:52:52.000000000, delta=9081000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:01.083000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:01.083000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, create new FileSnapshot: lastRead=2025-02-25 12:53:01.084000000, lastModified=2025-02-25 12:52:52.000000000, size=454, fileKey=(dev=801,ino=2099793)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:01.084000000, lastModified=2025-02-25 12:52:52.000000000, delta=9084000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/index, create new FileSnapshot: lastRead=2025-02-25 12:53:01.089000000, lastModified=2025-02-25 12:52:52.000000000, size=2660, fileKey=(dev=801,ino=2099792)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:01.084000000, lastModified=2025-02-25 12:52:52.000000000, delta=9084000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, create new FileSnapshot: lastRead=2025-02-25 12:53:01.092000000, lastModified=2025-02-25 12:52:52.000000000, size=21, fileKey=(dev=801,ino=2099805)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, create new FileSnapshot: lastRead=2025-02-25 12:53:01.093000000, lastModified=2025-02-25 12:52:52.000000000, size=41, fileKey=(dev=801,ino=2099802)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:01.084000000, lastModified=2025-02-25 12:52:52.000000000, delta=9084000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, isRacyClean=false, read=2025-02-25 12:53:01.092000000, lastModified=2025-02-25 12:52:52.000000000, delta=9092000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/HEAD, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, isRacyClean=false, read=2025-02-25 12:53:01.093000000, lastModified=2025-02-25 12:52:52.000000000, delta=9093000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/refs/heads/main, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 4096 bytes

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, create new FileSnapshot: lastRead=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, size=4096, fileKey=(dev=801,ino=2099727)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, delta=16096000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:581 - file=null, size changed from -1 to 41 bytes

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:272 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, create new FileSnapshot: lastRead=2025-02-25 12:53:01.097000000, lastModified=2025-02-25 12:52:46.000000000, size=41, fileKey=(dev=801,ino=2099730)

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:550 - file=/root/.config/jgit/config.lock, cannot be racily clean

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/root/.gitconfig, isRacyClean=false, read=2025-02-25 12:52:59.759000000, lastModified=1970-01-01 00:00:00.000000000, delta=1740487979759000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/root/.gitconfig, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, isRacyClean=false, read=2025-02-25 12:53:01.084000000, lastModified=2025-02-25 12:52:52.000000000, delta=9084000000 ns, racy<=2500000000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/config, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, isRacyClean=false, read=2025-02-25 12:53:01.097000000, lastModified=2025-02-25 12:52:46.000000000, delta=15097000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/shallow, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, delta=16096000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-

thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, delta=16096000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, delta=16096000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:513 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, isRacyClean=false, read=2025-02-25 12:53:01.096000000, lastModified=2025-02-25 12:52:45.000000000, delta=16096000000 ns, racy<=1251250000 ns

02/25 12:53:01 DEBUG o.e.j.i.s.file.FileSnapshot:557 - file=/home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic-/.git/objects/pack, is unmodified

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note Engineering rural note hydraulic.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for .gitignore

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for SBIR-STTR Submitted Project Pitch-00095759.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for SBIR-STTR Submitted Project Pitch-00098889.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing .course AIU ...pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for ip requested integrity thesis portofolio request commercial research book met.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for LICENSE

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for SBIR-STTR Submitted Project Pitch.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing curriculum AIU.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for tshingombe tshitadi atlantic career ,, design.docx

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note total assessment energy rural,.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for workplace experimental ip request research met thesis aiu,,eaton microsofr eskom city power.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note energy rurale

component .structe.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note , master energy rural component ...pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note energy rural . discovery project.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for tshingombe tshitadi atlantic career ,, design.pdf

02/25 12:53:01 INFO c.c.a.c.utils.LanguagesHelper:16 - No language found for drawing note free hand ..pdf

02/25 12:53:01 INFO c.c.a.c.t.DuplicationToolCollector:81 - No duplication tools found for language Markdown

02/25 12:53:01 INFO c.c.a.c.t.DuplicationToolCollector:81 - No duplication tools found for language YAML

02/25 12:53:01 DEBUG CodacyPlugins:17 - codacy/codacy-metrics-cloc:0.2.4 doesn't exist locally.

02/25 12:53:01 INFO CodacyPlugins:26 - Verifying if docker image codacy/codacy-metrics-cloc:0.2.4 exists locally. took 53ms

02/25 12:53:06 INFO CodacyPlugins:26 - Pulling docker image codacy/codacy-metrics-cloc:0.2.4. took 4668ms

02/25 12:53:07 INFO CodacyPlugins:26 - Running docker image codacy/codacy-metrics-cloc:0.2.4. took 1186ms

02/25 12:53:07 INFO c.c.a.c.a.CodacyPluginsAnalyser:48 - Completed metrics for metrics with 1 results

02/25 12:53:07 INFO CodacyPlugins:26 - Verifying if docker image codacy/codacy-metrics-cloc:0.2.4 exists locally. took 31ms

02/25 12:53:08 INFO CodacyPlugins:26 - Running docker image codacy/codacy-metrics-cloc:0.2.4. took 1234ms

02/25 12:53:08 INFO c.c.a.c.a.CodacyPluginsAnalyser:48 - Completed metrics for metrics with 6 results

02/25 12:53:08 INFO c.c.a.c.a.AnalyseExecutor:192 - Could not find local extra configuration for remark-lint

02/25 12:53:08 INFO c.c.a.c.a.AnalyseExecutor:181 - Preparing to run remark-lint with defaults

02/25 12:53:08 INFO c.c.analysis.core.tools.Tool:101 - Using the root directory /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-master-thesis-atlantic- to run

02/25 12:53:08 DEBUG CodacyPlugins:17 - codacy/codacy-remark-lint:2.5.8 doesn't exist locally.

02/25 12:53:08 INFO CodacyPlugins:26 - Verifying if docker image codacy/codacy-remark-lint:2.5.8 exists locally. took 32ms

02/25 12:53:14 INFO CodacyPlugins:26 - Pulling docker image codacy/codacy-remark-lint:2.5.8. took 5270ms

02/25 12:53:14 INFO CodacyPlugins:26 - Running docker image codacy/codacy-remark-lint:2.5.8. took 448ms

02/25 12:53:14 INFO c.c.a.c.a.CodacyPluginsAnalyser:28 - Completed analysis for remark-lint with 23 results

7s

Run github/codeql-action/upload-sarif@v3

with:

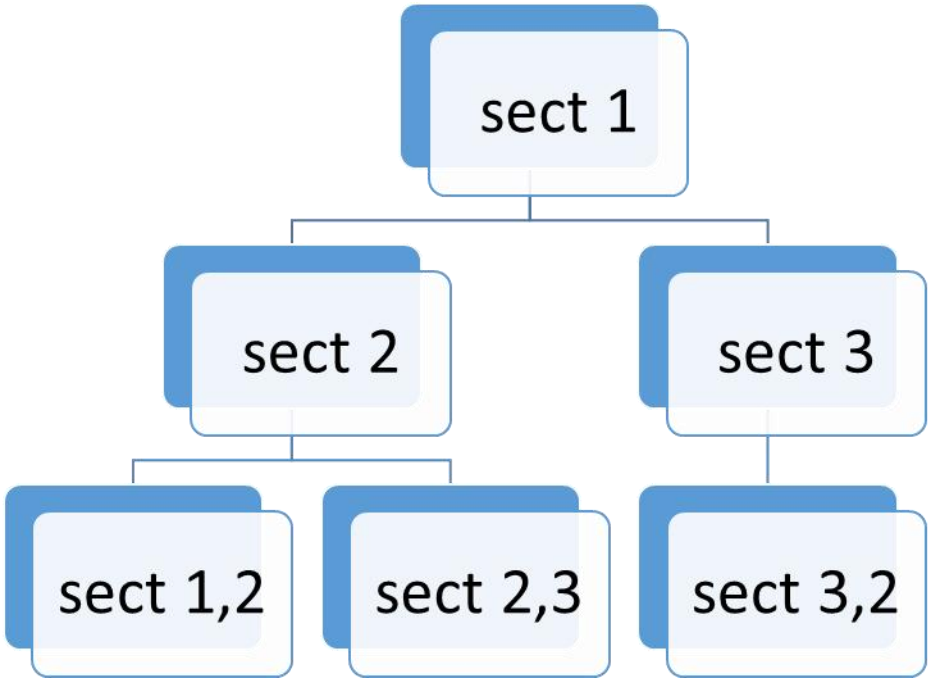
sarif_file: results.sarif

checkout_path: /home/runner/work/experimental-career-work-master-thesis-atlantic-/experimental-career-work-

master-thesis-atlantic-

token: ***

<span class="gmail-CheckStep-line-co



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nk you for the email and contacting the MPS "Data Office - Data Rights Unit datarights@met.police.uk". Our office is open Monday to Frid

Please note that we receive a large volume of emails through this mailbox, and all emails are dealt within date order. So it may not be possible to respond to you by return. Therefore we ask you to please be patient and allow us some time to respond to you, before you contact us again. We will get back to you as soon as we can and we thank you again for your patience.

Please note that our response may come from the email address DataRightsDONOTREPLY@met.police.uk . To ensure that our responses are not sent to your spam folder, please add this email address to your safe senders list.

The following types of applications are processed within this mailbox;

- Right of Access Requests (Formerly Subject Access Requests)
- Freedom of Information Act Requests
- National Guidance on Data Sharing for National Police Chiefs' Council (NPCC) in respect of Association of British Insurers (ABI) v.2.2
- Right to Erasure and Right to Rectification Requests
- Requests under the Environmental Information Regulations 2000

If you have any other request/application that fall outside the above criteria, please understand that these do not fall under the scope of our services, and we will be unable to help you. Consequently those emails will be disregarded by us and no response will be sent to you. ***Therefore, it is advisable you redirect your request to the appropriate unit***. *Please see below contact detail that may help you re-direct your request to the appropriate unit.*

Traffic related request	• Any queries relating to Automated Speed or Red light offences with a reference number that commences 0013 please email SafetyCameraManagers@met.pnn.police.uk • Traffic Offence Reports or Officer issued tickets or offences with a reference number that commences 0012, 0015, 0016 or 0018 please email: fixedpenaltynoticeenquiries@met.pnn.police.uk For all other traffic related matters, please use the below forms and contact details on it (Met Prosecution, Po box 510, DA15 0BQ); • Form 518A - Request for Traffic Case Reference number (met.police.uk) • Form 518 - Request for Police Collision Reports and Third Party Details in Road Traffic Collisions (met.police.uk) • Form 519 - Request for Police Collision Reports and Third Party Details in Road Traffic Collisions (met.police.uk) • Form 521 - Request for Police Collision Reports and Third Party Details in Road Traffic Collisions (met.police.uk)

Personal Monthly Budget

PROJECTED MONTHLY INCOME	**Income 1**	$2,500
	Extra income	$500
	Total monthly income	**$3,000**
ACTUAL MONTHLY INCOME	**Income 1**	$2,500
	Extra income	$500
	Total monthly income	**$3,000**

PROJECTED BALANC
ACTUAL BALANCE (A
DIFFERENCE (Actual

HOUSING	**Projected Cost**	**Actual Cost**	**Difference**
Mortgage or rent	$1,500	$1,400	$100
Phone	$60	$100	-$40
Electricity	$50	$60	-$10
Gas	$200	$180	$20
Water and sewer			$1,000
Cable			$1,000
Waste removal			$0
Maintenance or repairs			$0
Supplies			$0
Other			$0
Total	**$1,810**	**$1,740**	**$2,070**

ENTERTAINMENT
Video/DVD
CDs
Movies
Concerts
Sporting events
Live theater
Other
Other
Other
Total

TRANSPORTATION	**Projected Cost**	**Actual Cost**	**Difference**
Vehicle payment	$250	$250	$0
Bus/taxi fare			$0
Insurance			$0

LOANS
Personal
Student
Credit card
Credit card

Licensing			$0
Fuel			$0
Maintenance			$0
Other			$0
Total	**$250**	**$250**	**$0**

INSURANCE	**Projected Cost**	**Actual Cost**	**Difference**
Home			$0
Health			$0
Life			$0
Other			$0
Total	**$0**	**$0**	**$0**

FOOD	**Projected Cost**	**Actual Cost**	**Difference**
Groceries			$0
Dining out			$0
Other			$0
Total	**$0**	**$0**	**$0**

PETS	**Projected Cost**	**Actual Cost**	**Difference**
Food			$0
Medical			$0
Grooming			$0
Toys			$0
Other			$0
Total	**$0**	**$0**	**$0**

PERSONAL CARE	**Projected Cost**	**Actual Cost**	**Difference**
Medical			$0

Credit card
Other
Total

TAXES
Federal
State
Local
Other
Total

SAVINGS OR INVEST
Retirement account
Investment account
Other
Total

GIFTS AND DONATIO
Charity 1
Charity 2
Charity 3
Total

LEGAL
Attorney
Alimony
Payments on lien or j
Other
Total

Hair/nails			$0
Clothing			$0
Dry cleaning			$0
Health club			$0
Organization dues or fees			$0
Other			$0
Total	**$0**	**$0**	**$0**

TOTAL PROJECTED C
TOTAL ACTUAL COST
TOTAL DIFFERENCE

- · Mailing List
- · Help Centre
- · Your Applications:

Applications

Sorry. This opportunity is expired. It is now too late to complete your application.

Title	Status	Action
Volunteer Police Cadet Leader	Application Update	ReviewVolunteer Police Cadet Leader

- Mailing List
- Help Centre
- Your Applications:

Applications

Sorry. This opportunity is expired. It is now too late to complete your application.

Title	Status	Action
Volunteer Police Cadet Leader	Application Update	ReviewVolunteer Police Cadet Leader
Volunteer Police Cadet Leader	Application Update	ReviewVolunteer Police Cadet Leader
Vehicle Replacement Programme Manager - Band D - Counter Terrorism Policing HQ	Application Update	ReviewVehicle Replacement Programme Manager - Band D - Counter Terrorism Policing HQ

Twickenham DWP Recruitment Event	Registration Update	ReviewTwickenham DWP Recruitment Event
TSU Planner (DC) - Technical Intelligence Exploitation and Development team	Application Update	ReviewTSU Planner (DC) - Technical Intelligence Exploitation and Development team
Travel Services – Band C Service Delivery Manager	Application Update	ReviewTravel Services – Band C Service Delivery Manager
Thamesmead Recruitment Event	Registration Update	ReviewThamesmead Recruitment Event
Technology Lead - Data & Analysis - Counter Terrorism Policing HQ	Application Update	ReviewTechnology Lead - Data & Analysis - Counter Terrorism Policing HQ
Technical Training Manager - Technology CSC - Counter Terrorism Policing HQ	Application Update	ReviewTechnical Training Manager - Technology CSC - Counter Terrorism Policing HQ
Technical Training Manager - Technology CSC - Counter Terrorism Policing HQ	Application Update	ReviewTechnical Training Manager - Technology CSC - Counter Terrorism Policing HQ
Technical Support Operative	Application Update	ReviewTechnical Support Operative
Tactical Policy Advisor – Robbery and Knife Crime team-DC	Application Update	ReviewTactical Policy Advisor – Robbery and Knife Crime team-DC
Supplier Assurance Manager	Application Update	ReviewSupplier Assurance Manager
Supplier Assurance Lead	Application Update	ReviewSupplier Assurance Lead
Substantive Detective Inspector - DPS Specialist investigations	Application Update	ReviewSubstantive Detective Inspector - DPS Specialist investigations
Student Placement - Real Estate Development - Programme Support Officer 2025/2026	Application Update	ReviewStudent Placement - Real Estate Development - Programme Support Officer 2025/2026
Student Placement - Project Support Assistant - Strategy, Performance, and Planning - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Project Support Assistant - Strategy, Performance, and Planning - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Project Support Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Project Support Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Programme Support Officer – Real Estate Development,	Application Update	ReviewStudent Placement - Programme Support Officer – Real Estate Development,

Property Services Department 2024/2025		Property Services Department 2024/2025
Student Placement - Portfolio Office Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ	Application Update	Review Student Placement - Portfolio Office Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Performance Analyst - MO14 Performance	Application Update	ReviewStudent Placement - Performance Analyst - MO14 Performance
Student Placement - Media and Communication Administrator 2025/2026	Application Update	ReviewStudent Placement - Media and Communication Administrator 2025/2026
Student Placement - Junior Service Designer - Technology - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Junior Service Designer - Technology - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Junior Project Manager - Technology - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Junior Project Manager - Technology - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Junior DevOps Engineer - Technology - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Junior DevOps Engineer - Technology - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Forensic Business Assistant 2025/2026	Application Update	ReviewStudent Placement - Forensic Business Assistant 2025/2026
Student Placement - Estate and Asset Management Placement Student – Real Estate Management, Property Services Department 2024/2025	Application Update	ReviewStudent Placement - Estate and Asset Management Placement Student – Real Estate Management, Property Services Department 2024/2025
Student Placement - Construction and Building Engineering Services - Real Estate Development , Property Services Department 2024/2025	Application Update	ReviewStudent Placement - Construction and Building Engineering Services - Real Estate Development , Property Services Department 2024/2025
Student Placement - Construction and Building Engineering 2025/2026	Application Update	ReviewStudent Placement - Construction and Building Engineering 2025/2026
Student Placement - Communications Assistant - 2025/2026 - Communications - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Communications Assistant - 2025/2026 - Communications - Counter Terrorism Policing HQ
Student Placement - Business Change Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Business Change Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Borders Assistant - Borders Operations Centre - 2025/2026 Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Borders Assistant - Borders Operations Centre - 2025/2026 Counter Terrorism Policing HQ
Student Placement - Assurance and	Application	ReviewStudent Placement - Assurance and

Standards Team Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ	Update	Standards Team Assistant - Change - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Associate End User Computing Engineer - Technology - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Associate End User Computing Engineer - Technology - 2025/2026 - Counter Terrorism Policing HQ
Student Placement - Analysis & Research Assistant - Data & Analysis - 2025/2026- Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Analysis & Research Assistant - Data & Analysis - 2025/2026- Counter Terrorism Policing HQ
Student Placement - Accredited Financial Investigator - 2025/2026	Application Update	ReviewStudent Placement - Accredited Financial Investigator - 2025/2026
Student Placement - Project / Research Assistant - Data & Analysis - 2025/2026 - Counter Terrorism Policing HQ	Application Update	ReviewStudent Placement - Project / Research Assistant - Data & Analysis - 2025/2026 - Counter Terrorism Policing HQ
Strategy and Local Communications Manager(FTC for 12month)	Application Update	ReviewStrategy and Local Communications Manager(FTC for 12month)
Strategy and Local Communications Manager	Application Update	ReviewStrategy and Local Communications Manager
Staff Officer to Director of Intelligence & Covert Policing	Application Update	ReviewStaff Officer to Director of Intelligence & Covert Policing
Staff Officer to Director General - Detective Inspector - SLT - Counter Terrorism Policing HQ	Application Update	ReviewStaff Officer to Director General - Detective Inspector - SLT - Counter Terrorism Policing HQ
Staff Officer to Director General - Band C - SLT - Counter Terrorism Policing HQ	Application Update	ReviewStaff Officer to Director General - Band C - SLT - Counter Terrorism Policing HQ
SQL Server Database Administrator - Counter Terrorism Policing HQ	Application Update	ReviewSQL Server Database Administrator - Counter Terrorism Policing HQ
SQL Server Database Administrator - Counter Terrorism Policing HQ	Application Update	ReviewSQL Server Database Administrator - Counter Terrorism Policing HQ
Specialist Operations Recovery Manager	Application Update	ReviewSpecialist Operations Recovery Manager
Specialist Operations Recovery Driver - Perivale Car Pound	Application Update	ReviewSpecialist Operations Recovery Driver - Perivale Car Pound
Specialist Crime - North - Homicide Barking - HOLMES Typist	Application Update	ReviewSpecialist Crime - North - Homicide Barking - HOLMES Typist
SIU - Developing Threats Team - Detective Sergeant	Application Update	ReviewSIU - Developing Threats Team - Detective Sergeant
Shift Team – CJ Offender Management	Application	ReviewShift Team – CJ Offender Management

Services	Update	Services
Service Design and Transition Manager - Band C - Technology - Counter Terrorism Policing HQ	Application Update	ReviewService Design and Transition Manager - Band C - Technology - Counter Terrorism Policing HQ
Server Engineer - Technology - CSC - Counter Terrorism Policing HQ	Application Update	ReviewServer Engineer - Technology - CSC - Counter Terrorism Policing HQ
Senior Server Engineer - Counter Terrorism Policing HQ	Application Update	ReviewSenior Server Engineer - Counter Terrorism Policing HQ
Senior Safety Advisor First Aid	Application Update	ReviewSenior Safety Advisor First Aid
Senior Project Manager, Met Business & Operational Support Services	Application Update	ReviewSenior Project Manager, Met Business & Operational Support Services
Senior Project Manager - Change - Counter Terrorism Policing HQ	Application Update	ReviewSenior Project Manager - Change - Counter Terrorism Policing HQ
Senior Project Manager	Application Update	ReviewSenior Project Manager
Senior Project Manager	Application Update	ReviewSenior Project Manager
Senior MetLaw Officer	Application Update	ReviewSenior MetLaw Officer
Senior Media Officer	Application Update	ReviewSenior Media Officer
Senior Manager - Biometrics (Band B)	Application Update	ReviewSenior Manager - Biometrics (Band B)
Senior HR Policy Lead	Application Update	ReviewSenior HR Policy Lead
Senior HR Business Advisor	Application Update	ReviewSenior HR Business Advisor
Senior Development Operations Engineer - Band M - Counter Terrorism Policing HQ	Application Update	ReviewSenior Development Operations Engineer - Band M - Counter Terrorism Policing HQ
Senior Design Standards Manager	Application Update	ReviewSenior Design Standards Manager
Senior Content, Channels and Engagement Officer	Application Update	ReviewSenior Content, Channels and Engagement Officer
Senior Application Operations Engineer - Technology CSC - Counter Terrorism Policing HQ	Application Update	ReviewSenior Application Operations Engineer -Technology CSC - Counter Terrorism Policing HQ

Senior Administrative Assistant	Application Update	ReviewSenior Administrative Assistant
Security Assurance Manager	Application Update	ReviewSecurity Assurance Manager
Secure: Programme Delivery Senior Manager	Application Update	ReviewSecure: Programme Delivery Senior Manager
Safety Camera Prosecutions Team Manager	Application Update	ReviewSafety Camera Prosecutions Team Manager
Safety Camera Prosecutions Manager	Application Update	ReviewSafety Camera Prosecutions Manager
Safety Camera Processing Clerk	Application Update	ReviewSafety Camera Processing Clerk
Safety Academy QUAD Officer	Application Update	ReviewSafety Academy QUAD Officer
Royalty and Specialist Protection - RaSP 400 Inspector	Application Update	ReviewRoyalty and Specialist Protection - RaSP 400 Inspector
Royalty and Specialist Protection - Finance Administrator	Application Update	ReviewRoyalty and Specialist Protection - Finance Administrator
Royalty and Specialist Protection - Finance Administrator	Application Update	ReviewRoyalty and Specialist Protection - Finance Administrator
Review Officer	Application Update	ReviewReview Officer
Resourcing Assistant	Application Update	ReviewResourcing Assistant
Resource Management Office Manager	Application Update	ReviewResource Management Office Manager
Research Officer for Intelligence Development Team (East) - Band E Role	Application Update	ReviewResearch Officer for Intelligence Development Team (East) - Band E Role
Referencing & Vetting Insight and Governance Team Member	Application Update	ReviewReferencing & Vetting Insight and Governance Team Member
Referencing & Vetting Insight and Governance Team Member	Application Update	ReviewReferencing & Vetting Insight and Governance Team Member
Real Time Resourcing Desk Constable	Application Update	ReviewReal Time Resourcing Desk Constable
Real Time Resource Desk Sergeant	Application Update	ReviewReal Time Resource Desk Sergeant
RaSP Armed Deployment Management Unit (ADMU) PC	Application Update	ReviewRaSP Armed Deployment Management Unit (ADMU) PC

RAID Manager - Change - Counter Terrorism Policing HQ	Application Update	ReviewRAID Manager - Change - Counter Terrorism Policing HQ
Quality System Auditor	Application Update	ReviewQuality System Auditor
Quality Assurance Operative	Application Update	ReviewQuality Assurance Operative
Quality Assurance Lead	Application Update	ReviewQuality Assurance Lead
Quality Assurance Lead	Application Update	ReviewQuality Assurance Lead
PSO - Threat Assessment & Intelligence Unit - Intelligence Officer – Researcher	Application Update	ReviewPSO - Threat Assessment & Intelligence Unit - Intelligence Officer – Researcher
ProtectUK Head of Digital Delivery Unit - NaCTSO - Counter Terrorism Policing HQ.	Application Update	ReviewProtectUK Head of Digital Delivery Unit - NaCTSO - Counter Terrorism Policing HQ.
ProtectUK Head of Digital Content & Editorial - NaCTSO - Counter Terrorism Policing HQ	Application Update	ReviewProtectUK Head of Digital Content & Editorial - NaCTSO - Counter Terrorism Policing HQ
Project Support Officer	Application Update	ReviewProject Support Officer
Project Manager	Application Update	ReviewProject Manager
Project Adder - PC	Application Update	ReviewProject Adder - PC
Programme Support Officer	Application Update	ReviewProgramme Support Officer
Programme Manager - Change - Counter Terrorism Policing HQ	Application Update	ReviewProgramme Manager - Change - Counter Terrorism Policing HQ
Programme Management Office Administrator	Application Update	ReviewProgramme Management Office Administrator
Professional Standards Unit (MO12/MO4/CRIB) Band D	Application Update	ReviewProfessional Standards Unit (MO12/MO4/CRIB) Band D
Professional Standards - Misconduct Hearings Unit - Case Manager	Application Update	ReviewProfessional Standards - Misconduct Hearings Unit - Case Manager
Pound Officer Perivale	Application Update	ReviewPound Officer Perivale
Police Sergeant – Proactive Firearms Team	Application Update	ReviewPolice Sergeant – Proactive Firearms Team

Police prosecutor	Application Update	ReviewPolice prosecutor
Police prosecutor	Application Update	ReviewPolice prosecutor
Police Liaison Gateway Team	Application Update	ReviewPolice Liaison Gateway Team
Police Constable – Proactive Firearms Team Tasking & Co-ordination	Application Update	ReviewPolice Constable – Proactive Firearms Team Tasking & Co-ordination
Police Constable DPS - Professional Standard Unit	Application Update	ReviewPolice Constable DPS - Professional Standard Unit
POLICE CONSTABLE - CYBER CRIME PROACTIVE UNIT	Application Update	ReviewPOLICE CONSTABLE - CYBER CRIME PROACTIVE UNIT
PMO Lead - Change - Counter Terrorism Policing HQ	Application Update	ReviewPMO Lead - Change - Counter Terrorism Policing HQ
Performance and Assurance Team Member	Application Update	ReviewPerformance and Assurance Team Member
People & Development Lead, Operational Support Services	Application Update	ReviewPeople & Development Lead, Operational Support Services
PC Facial Recognition Technologies Team	Application Update	ReviewPC Facial Recognition Technologies Team
PC - MO6 Public Order Crime Team	Application Update	ReviewPC - MO6 Public Order Crime Team
PC - Covert Human Intelligence Source (CHIS) Handler	Application Update	ReviewPC - Covert Human Intelligence Source (CHIS) Handler
PA to DCS Band E	Application Update	ReviewPA to DCS Band E
Outreach Support	Talent Bank - Withdrawn	ReviewOutreach Support
Operations Support Officer	Application Update	ReviewOperations Support Officer
Operations Manager	Application Update	ReviewOperations Manager
Operations Lead - Superintendent	Application Update	ReviewOperations Lead - Superintendent
Operations Inspector	Application Update	ReviewOperations Inspector
Op Ford - Force Elected Official Advisor (FEOA) - Constable PaDP	Application Update	ReviewOp Ford - Force Elected Official Advisor (FEOA) - Constable PaDP

Online Insight Session	Registration Update	ReviewOnline Insight Session
Online Insight Session	Registration Update	ReviewOnline Insight Session
Office Manager - Band D - MIR - SO15	Application Update	ReviewOffice Manager - Band D - MIR - SO15
NPPF Step Two May 2024 Legal Exam - (Previously OSPRE) – Inspectors	Application Update	ReviewNPPF Step Two May 2024 Legal Exam - (Previously OSPRE) – Inspectors
NPPF Step Two March 2025 Legal Exam (Previously OSPRE) - Sergeant	Application Update	ReviewNPPF Step Two March 2025 Legal Exam (Previously OSPRE) - Sergeant
NPoCC Planner - Band E	Application Withdrawn	ReviewNPoCC Planner - Band E
New Scotland Yard Insight Session	Registration Update	ReviewNew Scotland Yard Insight Session
NCPP - CTSFO National Training Manager - Inspector - Counter Terrorism Policing HQ	Application Update	ReviewNCPP - CTSFO National Training Manager - Inspector - Counter Terrorism Policing HQ
National Surveillance Scheduling Team and Capability Support - Detective Inspector - Counter Terrorism Policing HQ	Application Update	ReviewNational Surveillance Scheduling Team and Capability Support - Detective Inspector - Counter Terrorism Policing HQ
National Referral Mechanism Coordinator	Application Update	ReviewNational Referral Mechanism Coordinator
National Police Chiefs' Council - National Serious & Organised Crime Portfolio (NSOC) Project Manager	Application Update	ReviewNational Police Chiefs' Council - National Serious & Organised Crime Portfolio (NSOC) Project Manager
National Police Chiefs Council - Programme Manager	Application Update	ReviewNational Police Chiefs Council - Programme Manager
National Police Chiefs Council - Programme Manager	Application Update	ReviewNational Police Chiefs Council - Programme Manager
National Police Chiefs Council - Internal Communications Manager	Application Update	ReviewNational Police Chiefs Council - Internal Communications Manager
National Investigators Examination (NIE) - 3rd June 2025	Application Update	ReviewNational Investigators Examination (NIE) - 3rd June 2025
National Firearms Instructor (NFI)	Application Update	ReviewNational Firearms Instructor (NFI)
National Counter Terrorism Security Office (NaCTSO) – Venues and Public Spaces Unit- Detective Inspector - Counter Terrorism	Application Update	ReviewNational Counter Terrorism Security Office (NaCTSO) – Venues and Public Spaces Unit- Detective Inspector - Counter Terrorism

Policing HQ		Policing HQ
Motorcycle Technician	Application Update	ReviewMotorcycle Technician
Motor Vehicle Technician	Application Update	ReviewMotor Vehicle Technician
Motor Vehicle Technician	Application Update	ReviewMotor Vehicle Technician
Motor Vehicle Technician	Application Update	ReviewMotor Vehicle Technician
MO7 Taskforce TSG -Police Sergeant	Application Update	ReviewMO7 Taskforce TSG -Police Sergeant
MO7 Taskforce Mounted Branch Inspector	Application Update	ReviewMO7 Taskforce Mounted Branch Inspector
MO3 Technical Surveillance Unit-DC - AV Ops	Application Update	ReviewMO3 Technical Surveillance Unit-DC - AV Ops
MO2 Met Intel - ANPR Auditor - Innovation Deployment & Compliance Team	Application Update	ReviewMO2 Met Intel - ANPR Auditor - Innovation Deployment & Compliance Team
MO19 Specialist Firearms Command – Development, Delivery, Equipment & Finance Sergeant	Application Update	ReviewMO19 Specialist Firearms Command – Development, Delivery, Equipment & Finance Sergeant
MO19 Specialist Firearms Command - Tactical Firearms Commander Inspector (UNARMED)	Application Update	ReviewMO19 Specialist Firearms Command - Tactical Firearms Commander Inspector (UNARMED)
MO19 Specialist Firearms Command - Tactical Firearms Commander Detective Inspector (UNARMED)	Application Update	ReviewMO19 Specialist Firearms Command - Tactical Firearms Commander Detective Inspector (UNARMED)
MMU Vehicle Technician	Application Update	ReviewMMU Vehicle Technician
Misconduct Hearings Unit - Usher	Application Update	ReviewMisconduct Hearings Unit - Usher
MetLaw Clerk	Application Update	ReviewMetLaw Clerk
MetLaw and Allocations Clerk	Application Update	ReviewMetLaw and Allocations Clerk
MetCC Workforce Management Lead	Application Update	ReviewMetCC Workforce Management Lead
MetCC Welfare Support Team Supervisor	Application Update	ReviewMetCC Welfare Support Team Supervisor

MetCC Welfare Support Team Member	Application Update	ReviewMetCC Welfare Support Team Member
MetCC Centre Facilities Support Staff	Application Update	ReviewMetCC Centre Facilities Support Staff
MetCC Centre Facilities Supervisor	Application Update	ReviewMetCC Centre Facilities Supervisor
Met Intel PC ANPR Investigations	Application Update	ReviewMet Intel PC ANPR Investigations
Met Intel DS ANPR Investigations	Application Update	ReviewMet Intel DS ANPR Investigations
Met Intel 24/7 Intelligence Officer	Application Update	ReviewMet Intel 24/7 Intelligence Officer
Met Intel 24/7 - Intelligence Supervisor	Application Update	ReviewMet Intel 24/7 - Intelligence Supervisor
Met Intel 24/7 - Intelligence Manager - Duty Officer	Application Update	ReviewMet Intel 24/7 - Intelligence Manager - Duty Officer
Met Business Services - Talent Acquisition Manager	Application Update	ReviewMet Business Services - Talent Acquisition Manager
Met Business Services - Talent Acquisition Lead	Application Update	ReviewMet Business Services - Talent Acquisition Lead
Media Officer	Application Update	ReviewMedia Officer
MBS Reporting Senior Analyst	Application Update	ReviewMBS Reporting Senior Analyst
LMS Administrator	Application Update	ReviewLMS Administrator
Licensing and Accreditation Training Development Officer - VAP's (NaCTSO) - Counter Terrorism Policing HQ	Application Update	ReviewLicensing and Accreditation Training Development Officer - VAP's (NaCTSO) - Counter Terrorism Policing HQ
Licensing Admin Support Officer	Application Update	ReviewLicensing Admin Support Officer
Leadership Facilitator	Application Withdrawn	ReviewLeadership Facilitator
Leadership Academy Trainer/Facilitator	Application Update	ReviewLeadership Academy Trainer/Facilitator
Leadership Academy Administration/Team Support	Application Update	ReviewLeadership Academy Administration/Team Support
Leadership Academy Administration/Team	Application	ReviewLeadership Academy

Supervisor	Update	Administration/Team Supervisor
Lead Software Developer - Counter Terrorism Policing HQ	Application Update	ReviewLead Software Developer - Counter Terrorism Policing HQ
Lead Dev Ops Engineer (Cloud Platform) - Technology CSC - Police Staff - Counter Terrorism Policing HQ	Application Update	ReviewLead Dev Ops Engineer (Cloud Platform) - Technology CSC - Police Staff - Counter Terrorism Policing HQ
Lead Data Analyst in the Strategic Insight Unit	Application Update	ReviewLead Data Analyst in the Strategic Insight Unit
Junior Software Developer - Counter Terrorism Policing HQ	Application Update	ReviewJunior Software Developer - Counter Terrorism Policing HQ
Junior Data Engineer	Application Update	ReviewJunior Data Engineer
Interest in being promoted to a Sergeant? Register your interest here and we will notify you when the promotion process launches.	Talent Bank - Withdrawn	ReviewInterest in being promoted to a Sergeant? Register your interest here and we will notify you when the promotion process launches.
Interest in being promoted to a Chief Superintendent? Register your interest here and we will notify you when the promotion process launches.	Talent Bank - Withdrawn	ReviewInterest in being promoted to a Chief Superintendent? Register your interest here and we will notify you when the promotion process launches.
Intelligence Officer - Public Order Public Safety Intelligence - MO2	Application Update	ReviewIntelligence Officer - Public Order Public Safety Intelligence - MO2
Intelligence Officer - PC - Intelligence - Counter Terrorism Policing HQ	Application Update	ReviewIntelligence Officer - PC - Intelligence - Counter Terrorism Policing HQ
Intelligence Officer - DC - Intelligence - Counter Terrorism Policing HQ	Application Update	ReviewIntelligence Officer - DC - Intelligence - Counter Terrorism Policing HQ
Intelligence Officer - Bomb Data Centre - FMT - SO15	Application Update	ReviewIntelligence Officer - Bomb Data Centre - FMT - SO15
Intelligence Manager – Public Order & Public Safety Intelligence - Inspector – MO2	Application Update	ReviewIntelligence Manager – Public Order & Public Safety Intelligence - Inspector – MO2
Intelligence Manager - Public Order & Public Safety Intelligence - Detective Inspector - MO2	Application Update	ReviewIntelligence Manager - Public Order & Public Safety Intelligence - Detective Inspector - MO2
Inspector to Chief Inspector Promotion Process 2024	Application Update	ReviewInspector to Chief Inspector Promotion Process 2024
Inspector - NPoCC SIB	Application Update	ReviewInspector - NPoCC SIB
Insight, Data and Evaluation Senior	Application	ReviewInsight, Data and Evaluation Senior

Manager	Update	Manager
Infrastructure Engineer	Application Update	ReviewInfrastructure Engineer
IDD - Junior Business Design Analyst	Application Update	ReviewIDD - Junior Business Design Analyst
Hub Coordination Team Manager - Band D - Prisons - Counter Terrorism Policing HQ	Application Update	ReviewHub Coordination Team Manager - Band D - Prisons - Counter Terrorism Policing HQ
HR Performance and Reporting Manager	Application Update	ReviewHR Performance and Reporting Manager
HR Performance and Reporting Lead	Application Update	ReviewHR Performance and Reporting Lead
HR People Performance Improvement Team – Senior Lead	Application Update	ReviewHR People Performance Improvement Team – Senior Lead
HR People Performance Improvement Team – Senior Lead	Application Update	ReviewHR People Performance Improvement Team – Senior Lead
HR Change Support Officer	Application Update	ReviewHR Change Support Officer
HR Administrator - Counter Terrorism Policing HQ	Application Update	ReviewHR Administrator - Counter Terrorism Policing HQ
HOLMES Typist	Application Update	ReviewHOLMES Typist
Higher Performance Analyst - Strategy, Planning & Performance - Counter Terrorism Policing HQ	Application Update	ReviewHigher Performance Analyst - Strategy, Planning & Performance - Counter Terrorism Policing HQ
Higher Computer Aided Surveyor / 3D Specialist	Application Update	ReviewHigher Computer Aided Surveyor / 3D Specialist
Health & Safety/Estates Manager - Band D - Counter Terrorism Policing HQ	Application Update	ReviewHealth & Safety/Estates Manager - Band D - Counter Terrorism Policing HQ
Head of Visits and Events	Application Update	ReviewHead of Visits and Events
Head of Visits and Events	Application Update	ReviewHead of Visits and Events
Head of Security Architecture	Application Update	ReviewHead of Security Architecture
Head of Portfolio Office (Met Business & Operational Support Services)	Application Update	ReviewHead of Portfolio Office (Met Business & Operational Support Services)
Head of Portfolio Office (Met Business &	Application	ReviewHead of Portfolio Office (Met Business

Operational Support Services)	Update	& Operational Support Services)
Head of Data Literacy and Culture	Application Update	ReviewHead of Data Literacy and Culture
Head of Data Engineering	Application Update	ReviewHead of Data Engineering
Grievance Assessor	Application Update	ReviewGrievance Assessor
Forensic Scientist	Application Update	ReviewForensic Scientist
Forensic Management Team - Ops Support - Detective Sergeant - Counter Terrorism Policing SO15	Application Update	ReviewForensic Management Team - Ops Support - Detective Sergeant - Counter Terrorism Policing SO15
Forensic Examiner – Forensic Firearms Unit (FFU)	Application Update	ReviewForensic Examiner – Forensic Firearms Unit (FFU)
Forensic Collision Investigator – Trainee	Application Update	ReviewForensic Collision Investigator – Trainee
Fleet Contract Lifecycle Support	Application Withdrawn	ReviewFleet Contract Lifecycle Support
Fleet Administrator	Application Update	ReviewFleet Administrator
Fingerprint Team Leader	Application Update	ReviewFingerprint Team Leader
Financial Investigator	Application Update	ReviewFinancial Investigator
Finance Business Partner - Band M	Application Update	ReviewFinance Business Partner - Band M
Facial Identification Intelligence Researcher	Application Update	ReviewFacial Identification Intelligence Researcher
Facial Identification Intelligence Research Supervisor	Application Update	ReviewFacial Identification Intelligence Research Supervisor
Experienced Intelligence Analyst	Application Update	ReviewExperienced Intelligence Analyst
Equip for Service (EFS) Coordinator	Application Update	ReviewEquip for Service (EFS) Coordinator
Equality Impact Assessment Manager	Application Update	ReviewEquality Impact Assessment Manager
Enquiry Officer	Application Update	ReviewEnquiry Officer

Electronics Senior Technologist	Application Update	ReviewElectronics Senior Technologist
Electronics Development Manager	Application Update	ReviewElectronics Development Manager
Electronics Development Manager	Application Update	ReviewElectronics Development Manager
Electronics Development Engineer	Application Update	ReviewElectronics Development Engineer
Electronics Development Engineer	Application Update	ReviewElectronics Development Engineer
Electronics Development Engineer	Application Update	ReviewElectronics Development Engineer
Electronics Development Engineer	Application Update	ReviewElectronics Development Engineer
Edmonton Insight Session	Registration Update	ReviewEdmonton Insight Session
DS - Public Order Crime Team	Application Update	ReviewDS - Public Order Crime Team
Driver Assistance Centre Team Leader	Application Update	ReviewDriver Assistance Centre Team Leader
DPS Intelligence Bureau - Integrity Screening Unit -Detective Constable (Substantive)	Application Update	ReviewDPS Intelligence Bureau - Integrity Screening Unit -Detective Constable (Substantive)
DPS Digital Exploitation Team: Digital Intelligence Analyst - Anti-Corruption and Abuse Command	Application Update	ReviewDPS Digital Exploitation Team: Digital Intelligence Analyst - Anti-Corruption and Abuse Command
DNA Services Consultant - BIOMETRICS UNIT (Band L)	Application Update	ReviewDNA Services Consultant - BIOMETRICS UNIT (Band L)
Distribution Driver	Application Update	ReviewDistribution Driver
Disruptions & APMIS Lead	Application Update	ReviewDisruptions & APMIS Lead
Disclosure Support (deputy to Disclosure Manager, Economic Crime)	Application Update	ReviewDisclosure Support (deputy to Disclosure Manager, Economic Crime)
Digital Strategy Advisor - Digital Forensics	Application Update	ReviewDigital Strategy Advisor - Digital Forensics
Digital Strategy Advisor - Digital Forensics	Application Update	ReviewDigital Strategy Advisor - Digital Forensics

Digital Project Officer - NDES Service 3 - SO15	Application Update	ReviewDigital Project Officer - NDES Service 3 - SO15
Digital Operations - Digital Investigator (DMI) - PC	Application Update	ReviewDigital Operations - Digital Investigator (DMI) - PC
Digital Forensic Technician	Application Update	ReviewDigital Forensic Technician
Digital Forensic Manager	Application Update	ReviewDigital Forensic Manager
Digital Engagement Officer	Application Update	ReviewDigital Engagement Officer
Development Technician - Software Developer	Application Update	ReviewDevelopment Technician - Software Developer
Development Technician - Software Developer	Application Update	ReviewDevelopment Technician - Software Developer
Development Operations Engineer - Band N - Counter Terrorism Policing HQ	Application Update	ReviewDevelopment Operations Engineer - Band N - Counter Terrorism Policing HQ
Development Engineer - Software Developer	Application Update	ReviewDevelopment Engineer - Software Developer
Development Engineer	Application Update	ReviewDevelopment Engineer
Development Engineer	Application Update	ReviewDevelopment Engineer
Developing Threats Team – PC	Application Update	ReviewDeveloping Threats Team – PC
Dev Ops Engineer (Cloud Platform) - Technology CSC - Police Staff - Counter Terrorism Policing HQ	Application Update	ReviewDev Ops Engineer (Cloud Platform) - Technology CSC - Police Staff - Counter Terrorism Policing HQ
Detective Sergeant London Region Protected Persons Unit (LRPPU)	Application Update	ReviewDetective Sergeant London Region Protected Persons Unit (LRPPU)
Detective Sergeant Economic Crime - Fraud investigation teams	Application Update	ReviewDetective Sergeant Economic Crime - Fraud investigation teams
Detective Sergeant - Image Retrieval Unit	Application Update	ReviewDetective Sergeant - Image Retrieval Unit
Detective Sergeant - Frontline Policing Delivery Unit - Detective Pathways	Application Update	ReviewDetective Sergeant - Frontline Policing Delivery Unit - Detective Pathways
Detective Sergeant - Complex Investigation Team (CIT)	Application Update	ReviewDetective Sergeant - Complex Investigation Team (CIT)

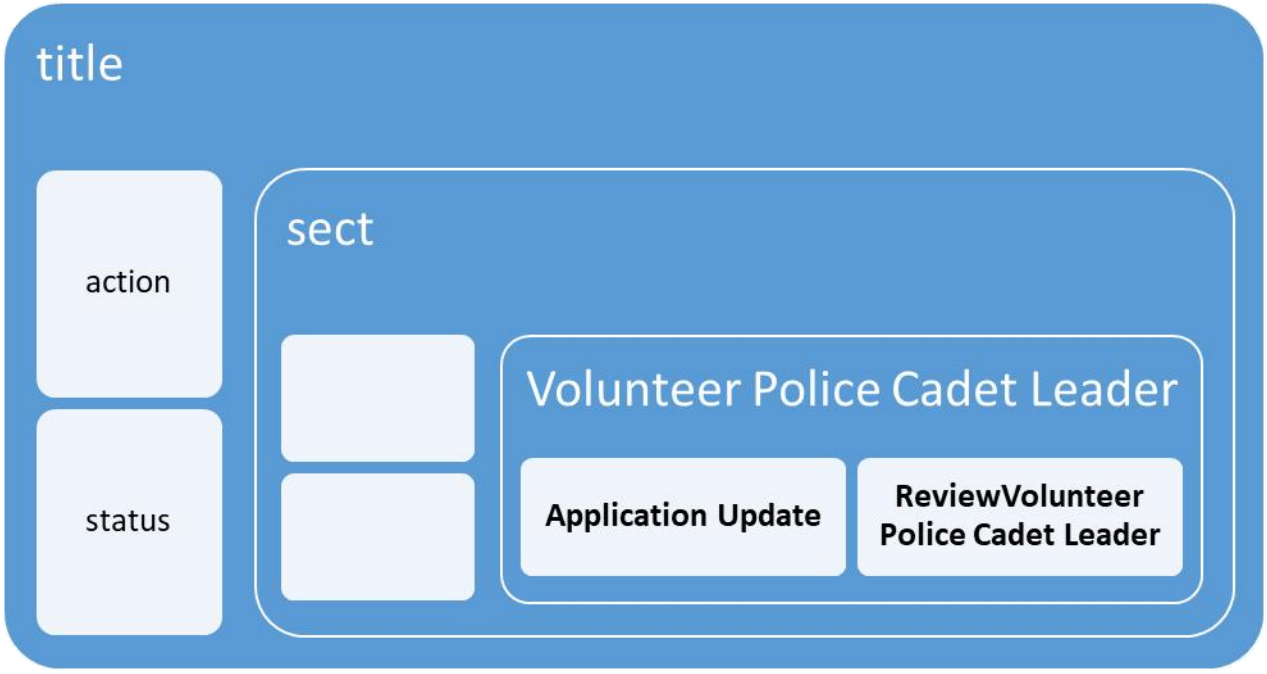
Detective Inspector-Homicide Team	Application Update	ReviewDetective Inspector-Homicide Team
Detective Inspector – Trident Reactive : Specialist Crime (West Hub)	Application Update	ReviewDetective Inspector – Trident Reactive : Specialist Crime (West Hub)
Detective Inspector - Trident Reactive South	Application Update	ReviewDetective Inspector - Trident Reactive South
Detective Inspector - Specialist Investigation Unit - DPS	Application Withdrawn	ReviewDetective Inspector - Specialist Investigation Unit - DPS
Detective Inspector - Inquiry & Review Support Command (IRSC)	Application Update	ReviewDetective Inspector - Inquiry & Review Support Command (IRSC)
Detective Inspector - Homicide Teams at Barking	Application Update	ReviewDetective Inspector - Homicide Teams at Barking
Detective Constable - DASO - Professional Standards	Application Update	ReviewDetective Constable - DASO - Professional Standards
Designated Detention Officer	Application Update	ReviewDesignated Detention Officer
Deputy National Coordinator, Protect & Prepare - Supt - Counter Terrorism Policing HQ	Application Update	ReviewDeputy National Coordinator, Protect & Prepare - Supt - Counter Terrorism Policing HQ
DDaT Operations Manager	Application Update	ReviewDDaT Operations Manager
DC - Public Order Crime Team	Application Update	ReviewDC - Public Order Crime Team
Data Quality Management Lead	Application Update	ReviewData Quality Management Lead
Data Management Officer Indexer - Band E - NDMC - Counter Terrorism Policing HQ	Application Update	ReviewData Management Officer Indexer - Band E - NDMC - Counter Terrorism Policing HQ
Cyber Unit - DI Protect, Prepare and Prevent	Application Update	ReviewCyber Unit - DI Protect, Prepare and Prevent
Custody Healthcare Practitioner Open Day Event - Hammersmith Police Station - Thursday 27th June 2024 13:00PM	Registration Update	ReviewCustody Healthcare Practitioner Open Day Event - Hammersmith Police Station - Thursday 27th June 2024 13:00PM
Custody Healthcare Practitioner Open Day Event - Charing Cross Police Station - Thursday 24th October 2024 13:00PM	Registration Update	ReviewCustody Healthcare Practitioner Open Day Event - Charing Cross Police Station - Thursday 24th October 2024 13:00PM
Custody Healthcare Practitioner (Registered Nurse / Registered Paramedic)	Application Update	ReviewCustody Healthcare Practitioner (Registered Nurse / Registered Paramedic)

CTSFO Tactical Advisor	Application Update	ReviewCTSFO Tactical Advisor
CSC - Offender Management - International Assistance Unit (IAU) Detective Constable	Application Update	ReviewCSC - Offender Management - International Assistance Unit (IAU) Detective Constable
CSC - Offender Management - Central Orders Team Police Constable	Application Update	ReviewCSC - Offender Management - Central Orders Team Police Constable
Crime Academy DC - Interview Team	Application Update	ReviewCrime Academy DC - Interview Team
Covert Admin (COVAD) Deputy Manager	Application Update	ReviewCovert Admin (COVAD) Deputy Manager
Counter Weapons Threat Team Officer - PC - Counter Terrorism Policing HQ	Application Update	ReviewCounter Weapons Threat Team Officer - PC - Counter Terrorism Policing HQ
Counter Terrorism Security Advisor (CTSA)	Application Update	ReviewCounter Terrorism Security Advisor (CTSA)
Counter Terrorism Security Advisor (CTSA)	Application Update	ReviewCounter Terrorism Security Advisor (CTSA)
Counter Terrorism Police Liaison Officer - DSU - IOPS - Counter Terrorism Policing SO15	Application Withdrawn	ReviewCounter Terrorism Police Liaison Officer - DSU - IOPS - Counter Terrorism Policing SO15
Correspondence Manager	Application Update	ReviewCorrespondence Manager
Coroner's Officer Manager	Application Update	ReviewCoroner's Officer Manager
Contract Lifecycle Support	Application Update	ReviewContract Lifecycle Support
CONNECT Support Team- User Support Specialist	Application Update	ReviewCONNECT Support Team- User Support Specialist
Compliance & Assurance Officer - Counter Terrorism Policing HQ	Application Update	ReviewCompliance & Assurance Officer - Counter Terrorism Policing HQ
Complex Investigation Team (CIT) Police Constable SOIT	Application Update	ReviewComplex Investigation Team (CIT) Police Constable SOIT
Complex Investigation Team (CIT) Disclosure Support Officer	Application Update	ReviewComplex Investigation Team (CIT) Disclosure Support Officer
Complex Investigation Team (CIT) Detective Inspector	Application Update	ReviewComplex Investigation Team (CIT) Detective Inspector
Complex Investigation Team (CIT) Detective Constable	Application Update	ReviewComplex Investigation Team (CIT) Detective Constable

Complaint Resolution Unit (CRU) - Complaint handler	Application Update	ReviewComplaint Resolution Unit (CRU) - Complaint handler
Complaint Handler	Application Update	ReviewComplaint Handler
Communications Manager – Marketing, Campaigns and Internal Communications	Application Update	ReviewCommunications Manager – Marketing, Campaigns and Internal Communications
Communications Lead – Chief Media Officer	Application Update	ReviewCommunications Lead – Chief Media Officer
Communication Planning Manager	Application Update	ReviewCommunication Planning Manager
Commercial Lead Solution Delivery	Application Update	ReviewCommercial Lead Solution Delivery
Commercial Consultant- Assurance and Risk	Application Update	ReviewCommercial Consultant- Assurance and Risk
Commercial Consultant	Application Update	ReviewCommercial Consultant
Commercial Apprentice	Application Update	ReviewCommercial Apprentice
CJOMS Shift Team Manager	Application Update	ReviewCJOMS Shift Team Manager
Character Enquiry Centre Team Leader	Application Update	ReviewCharacter Enquiry Centre Team Leader
Centralised Administration Team Member	Application Update	ReviewCentralised Administration Team Member
Centralised Admin - Typing Services	Application Update	ReviewCentralised Admin - Typing Services
CCTV Investigations Assessment/Review - Band D - NDES S3 - SO15	Application Update	ReviewCCTV Investigations Assessment/Review - Band D - NDES S3 - SO15
Casualty Bureau (CB) Co-ordinator	Application Update	ReviewCasualty Bureau (CB) Co-ordinator
Case Management Administrator	Application Update	ReviewCase Management Administrator
Capital Manager	Application Update	ReviewCapital Manager
Business Change Supervisor	Application Update	ReviewBusiness Change Supervisor
Business Change Specialist	Application Update	ReviewBusiness Change Specialist

Business Change Manager - Change - Counter Terrorism Policing HQ	Application Update	ReviewBusiness Change Manager - Change - Counter Terrorism Policing HQ
Business Change Lead - Change - Counter Terrorism Policing HQ	Application Update	ReviewBusiness Change Lead - Change - Counter Terrorism Policing HQ
Business Change Communications Specialist	Application Update	ReviewBusiness Change Communications Specialist
Business Assurance Junior Manager	Application Update	ReviewBusiness Assurance Junior Manager
Business and Policy Support Officer - Data & Analysis - Counter Terrorism Policing HQ	Application Update	ReviewBusiness and Policy Support Officer - Data & Analysis - Counter Terrorism Policing HQ
Business Analyst – Strategy, Planning and Performance (SPP) Counter Terrorism Policing HQ	Application Update	ReviewBusiness Analyst – Strategy, Planning and Performance (SPP) Counter Terrorism Policing HQ
Building Manager	Application Update	ReviewBuilding Manager
Biometric Intelligence Case Officer - Band D - NDES S6 - SO15	Application Update	ReviewBiometric Intelligence Case Officer - Band D - NDES S6 - SO15
Beckton Recruitment Event	Registration Update	ReviewBeckton Recruitment Event
BCU Learning and Development Lead	Application Update	ReviewBCU Learning and Development Lead
BCU Learning and Development Co-ordinator	Application Update	ReviewBCU Learning and Development Co-ordinator
Band E Specialist Crime CPS Liaison Team / Met Police Room Central Criminal Court	Application Update	ReviewBand E Specialist Crime CPS Liaison Team / Met Police Room Central Criminal Court
Audit and Risk Manager - Strategic Planning & Risk	Application Update	ReviewAudit and Risk Manager - Strategic Planning & Risk
Apprentice Vehicle Mechanical Electrical Trim (M.E.T.) Technician	Application Update	ReviewApprentice Vehicle Mechanical Electrical Trim (M.E.T.) Technician
Apprentice Motorcycle Technician	Application Update	Review Apprentice Motorcycle Technician
Anti-Corruption and Abuse (ACAC) Intelligence Bureau.	Application Update	ReviewAnti-Corruption and Abuse (ACAC) Intelligence Bureau.
Administrative Officer – MO2 - HQ Operations	Application Update	ReviewAdministrative Officer – MO2 - HQ Operations
202402 - MPS Return Scheme Retired	Application	Review202402 - MPS Return Scheme Retired

Officers	Update	Officers
202402 - MPS Return Scheme Approaching Retirement	Application Update	Review202402 - MPS Return Scheme Approaching Retirement
2024-07 Police Constable Degree Apprenticeship (PCDA)	Application Update	Review2024-07 Police Constable Degree Apprenticeship (PCDA)
2024-07 Police Constable Degree Apprenticeship (PCDA)	Application Update	Review2024-07 Police Constable Degree Apprenticeship (PCDA)
202307 Transferring Officers - Specialist Team	Application Update	Review202307 Transferring Officers - Specialist Team
202307 Transferring Officers - Neighbourhood Team	Application Update	Review202307 Transferring Officers - Neighbourhood Team
202305 - Police Community Support Officer (PCSO)	Application Update	Review202305 - Police Community Support Officer (PCSO)
202305 - Police Community Support Officer (PCSO)	Application Update	Review202305 - Police Community Support Officer (PCSO)
202207 - Detective Constable Pathway	Application Update	Review202207 - Detective Constable Pathway
202203 Rejoiner Officers	Application Update	Review202203 Rejoiner Officers
07-2024 Special Constable (Volunteer Police Constable)	Application Update	Review07-2024 Special Constable (Volunteer Police Constable)
07-2024 Special Constable (Volunteer Police Constable)	Application Update	Review07-2024 Special Constable (Volunteer Police Constable)
042024 - DCEP (Detective Constable Entry Programme)	Application Update	Review042024 - DCEP (Detective Constable Entry Programme)



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21.1. Introduction to Distributed Ledger Technology ..... **Error! Bookmark not defined.**

21.2.The Need for Distributed Ledger Technology in Education ..... **Error! Bookmark not defined.**

21.3.Blockchain for Secure Credentialing ..... **Error! Bookmark not defined.**

21.4.Smart Contracts in Educational Transactions ..... **Error! Bookmark not defined.**

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21.6.Case Studies of DLT in Education ..... **Error! Bookmark not defined.**

21.7.Future Trends in DLT and EdTech ..... **Error! Bookmark not defined.**

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23.4.Neuroscience Basics for Educators ..... **Error! Bookmark not defined.**

23.5.Brain-Computer Interfaces in Education ..... **Error! Bookmark not defined.**

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24.3.Fundamentals of Electrochemical Engineering ..... **Error! Bookmark not defined.**

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24.5.Automating Electrochemical Process Controls ..... **Error! Bookmark not defined.**

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25.2.Introduction to Renewable Energy ..... **Error! Bookmark not defined.**

25.3.Educational Technology Tools ..... **Error! Bookmark not defined.**

25.4.Designing Interactive Learning Modules ..... **Error! Bookmark not defined.**

25.5.Gamification in Renewable Energy Education ..... **Error! Bookmark not defined.**

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29.3.Radio Frequency Fundamentals ..... **Error! Bookmark not defined.**

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30.2. Fundamentals of Electrical Systems in Construction ..... **Error! Bookmark not defined.**
30.3.Electrical Safety Standards and Codes ..... **Error! Bookmark not defined.**
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30.5Sustainable and Renewable Energy Technologies ..... **Error! Bookmark not defined.**
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30.2.Advanced Power System Analysis ..... **Error! Bookmark not defined.**

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32.4.Solar Energy Technologies ..... **Error! Bookmark not defined.**

32.5.Wind Energy Systems ..... **Error! Bookmark not defined.**

32.6.Bioenergy and Biomass ..... **Error! Bookmark not defined.**

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32.10.Policy and Economics of Clean Energy ..... **Error! Bookmark not defined.**
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32.12.Future Directions in Clean Energy and Ecotechnology ..... **Error! Bookmark not defined.**
2.1 Clean Energy Technology: Ecotechnology Applications ..... **Error! Bookmark not defined.**
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36. Topics: ..... **Error! Bookmark not defined.**

37. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering ..... **Error! Bookmark not defined.**

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36.5.Deep Learning and Neural Networks ..... **Error! Bookmark not defined.**
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37.10 Deployment and Scaling of AI Solutions ..... **Error! Bookmark not defined.**
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37.3.Sensor Technologies and Data Processing ..... **Error! Bookmark not defined.**
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38.3.Introduction to Electrochemical Engineering ..... **Error! Bookmark not defined.**
38.4.Battery Technologies for Infrastructure ..... **Error! Bookmark not defined.**
38.5.Fuel Cells and Their Applications ..... **Error! Bookmark not defined.**
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40.3.Battery Chemistry and Physics ..... **Error! Bookmark not defined.**
40.4.Design and Functionality of Battery Cells ..... **Error! Bookmark not defined.**
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41.5 Automating Electrical Design Processes ..... **Error! Bookmark not defined.**
41.6 Data Migration and Management ..... **Error! Bookmark not defined.**
41.7 RPA in Control Systems ..... **Error! Bookmark not defined.**
41.8 Machine Learning and RPA ..... **Error! Bookmark not defined.**
41.9 RPA and IoT in Electrical Systems ..... **Error! Bookmark not defined.**
41.10 Security and Ethics in RPA ..... **Error! Bookmark not defined.**
44..1. Define the Problem ..... **Error! Bookmark not defined.**
2. Develop the Mathematical Model ..... **Error! Bookmark not defined.**
3. Simplify the Equations ..... **Error! Bookmark not defined.**
4. Analytical Solution (if possible) ..... **Error! Bookmark not defined.**
5. Numerical Solution (if necessary) ..... **Error! Bookmark not defined.**
6. Simulation and Validation ..... **Error! Bookmark not defined.**
7. Optimization (if applicable) ..... **Error! Bookmark not defined.**
Example Calculation: Load Flow Analysis in Power Systems ..... **Error! Bookmark not defined.**
1. Circuit Analysis ..... **Error! Bookmark not defined.**

2. Electromagnetics ..... **Error! Bookmark not defined.**
3. Signal Processing ..... **Error! Bookmark not defined.**
4. Control Systems ..... **Error! Bookmark not defined.**
5. Power Systems ..... **Error! Bookmark not defined.**
6. Electronics ..... **Error! Bookmark not defined.**
7. Digital Systems ..... **Error! Bookmark not defined.**
8. Communication Systems ..... **Error! Bookmark not defined.**
9. Renewable Energy Systems ..... **Error! Bookmark not defined.**
1. Circuit Analysis ..... **Error! Bookmark not defined.**
2. Electromagnetics ..... **Error! Bookmark not defined.**
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7. Digital Systems ..... **Error! Bookmark not defined.**
8. Communication Systems ..... **Error! Bookmark not defined.**
9. Renewable Energy Systems ..... **Error! Bookmark not defined.**
. Circuit Design and Analysis ..... **Error! Bookmark not defined.**
2. Power Systems Engineering ..... **Error! Bookmark not defined.**
3. Control Systems ..... **Error! Bookmark not defined.**
4. Communication Systems ..... **Error! Bookmark not defined.**
5. Electronics and Semiconductor Design ..... **Error! Bookmark not defined.**
6. Renewable Energy Systems ..... **Error! Bookmark not defined.**
7. Building and Infrastructure ..... **Error! Bookmark not defined.**
8. Biomedical Engineering ..... **Error! Bookmark not defined.**
1. Signal Processing ..... **Error! Bookmark not defined.**
2. Communication Systems ..... **Error! Bookmark not defined.**
3. Information Theory ..... **Error! Bookmark not defined.**
4. Network Theory ..... **Error! Bookmark not defined.**
5. Electromagnetic Theory ..... **Error! Bookmark not defined.**
6. Digital Communication ..... **Error! Bookmark not defined.**
1. Signal Processing ..... **Error! Bookmark not defined.**

2. Communication Systems ..... **Error! Bookmark not defined.**
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4. Network Theory ..... **Error! Bookmark not defined.**
5. Electromagnetic Theory ..... **Error! Bookmark not defined.**
6. Digital Communication ..... **Error! Bookmark not defined.**
Practical Examples: ..... **Error! Bookmark not defined.**
IoT (Internet of Things) ..... **Error! Bookmark not defined.**
Solar Power Systems ..... **Error! Bookmark not defined.**
Wind Energy Projects ..... **Error! Bookmark not defined.**
Communication Systems Calculations ..... **Error! Bookmark not defined.**
1. MIMO (Multiple Input Multiple Output) Systems ..... **Error! Bookmark not defined.**
2. Satellite Communication ..... **Error! Bookmark not defined.**
3. Optical Fiber Communication ..... **Error! Bookmark not defined.**
4. IoT (Internet of Things) ..... **Error! Bookmark not defined.**
Ancient Times ..... **Error! Bookmark not defined.**
System Design and Operation ..... **Error! Bookmark not defined.**
Battery Technologies for Infrastructure ..... **Error! Bookmark not defined.**
34.6 Performance Benefits of Immutable Data ..... **Error! Bookmark not defined.**
38.7 Electrochemical Sensors and Monitoring ..... **Error! Bookmark not defined.**
38.8 Electrolysis and Industrial Processes ..... **Error! Bookmark not defined.**
38.9 Sustainability and Electrochemical Engineering ..... **Error! Bookmark not defined.**
5. Automating Electrical Design Processes ..... **Error! Bookmark not defined.**
Integral and Derivative Calculations in Automating Electrical Design Processes **Error! Bookmark not defined.**
Project Management in Electrical Engineering ..... **Error! Bookmark not defined.**
Integral and Derivative Calculations in Project Management ..... **Error! Bookmark not defined.**
Wind Energy, Solar Energy, and Hydroelectric Power ..... **Error! Bookmark not defined.**
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Understanding the Basic Concepts of Social Media Marketing ..... **Error! Bookmark not defined.**
Television and Radio Production Essentials ..... **Error! Bookmark not defined.**
Roberto Aldrett - AIU ..... **Error! Bookmark not defined.**
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Life-Coach Consulting ..... **Error! Bookmark not defined.**
The Future Of Science and Engineering ..... **Error! Bookmark not defined.**
The Constantly Changing Education Landscape ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
Core Courses and Topics in Engineering Systems: ..... **Error! Bookmark not defined.**
Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
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Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
Core Courses and Topics in Engineering Systems: ..... **Error! Bookmark not defined.**
Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Student name : tshingombe tshitadi ..... **Error! Bookmark not defined.**
1 topics : ..... **Error! Bookmark not defined.**
1 AGI in Human-Machine Collaboration ..... **Error! Bookmark not defined.**
Future Scenarios of AGI Development ..... **Error! Bookmark not defined.**
1.10nline Retail and E-commerce in the Renewable Energy Sector .... **Error! Bookmark not defined.**
1.2 Introduction to E-commerce in the Renewable Energy Sector .. **Error! Bookmark not defined.**
1.3 Understanding the Renewable Energy Market ..... **Error! Bookmark not defined.**
Targeted, flexible and co-ordinated policies can unlock the potential of e-commerce **Error! Bookmark not defined.**
1.4. E-commerce Strategies for Renewable Energy Products ..... **Error! Bookmark not defined.**
1.4 Consumer Behavior in Online Retail ..... **Error! Bookmark not defined.**
3.1 Electric power B2B descriptions ..... **Error! Bookmark not defined.**
3.2 Notations ..... **Error! Bookmark not defined.**
1.5 Digital Marketing for Renewable Energy E-commerce ..... **Error! Bookmark not defined.**
1.6. Sustainable Practices in E-commerce ..... **Error! Bookmark not defined.**
1.7 Case Studies in Renewable Energy E-commerce: ..... **Error! Bookmark not defined.**

3.3 Fusion of behavioral data ..... **Error! Bookmark not defined.**

3.4 Fusion of item attribute information ..... **Error! Bookmark not defined.**

3.5 Fusion of behavioral data and item information ..... **Error! Bookmark not defined.**

1.8 Regulatory Environment for Online Retail in Renewable Energy: **Error! Bookmark not defined.**

Experiments and discussion ..... **Error! Bookmark not defined.**

4.1 Data descriptions ..... **Error! Bookmark not defined.**

1.9 Future Trends in Online Retail and Renewable Energy ..... **Error! Bookmark not defined.**

Future Research Frontiers in AI for the E-commerce Sector ..... **Error! Bookmark not defined.**

2.1Publishing and Natural Resources Management: ..... **Error! Bookmark not defined.**

2.2 Introduction to Sustainable Natural Resources Management: .. **Error! Bookmark not defined.**

This topic covers the fundamental principles of sustainable natural resource management and its importance for future generations. Challenges in natural resource management for ecological sustainability ..... **Error! Bookmark not defined.**

2.3.1 Resource planning strategy and ownership regime ..... **Error! Bookmark not defined.**

2.3 The Role of Publishing in Sustainability: ..... **Error! Bookmark not defined.**

2.4 Environmental Journalism and Communication ..... **Error! Bookmark not defined.**

2.5 Digital Publishing and New Media ..... **Error! Bookmark not defined.**

2.6 Content Creation for Natural Resource Management ..... **Error! Bookmark not defined.**

2.2. New journals on SDG-relevant topics ..... **Error! Bookmark not defined.**

2.8 Sustainable Practices in Publishing: ..... **Error! Bookmark not defined.**

2.9. Case Studies in Effective Sustainability Communication: ..... **Error! Bookmark not defined.**

3.3. Equity recommended ..... **Error! Bookmark not defined.**

4. Translating research into practice ..... **Error! Bookmark not defined.**

4.1. Cognitive accessibility ..... **Error! Bookmark not defined.**

3.1 Masters in Supply Chain Management and Traceability ..... **Error! Bookmark not defined.**

3.2 Introduction to Supply Chain Management ..... **Error! Bookmark not defined.**

between functions within their own companies, but also with other An Introduction to Supply Chain Management ..... **Error! Bookmark not defined.**

3.3. Principles of Traceability ..... **Error! Bookmark not defined.**

3.4 Software Engineering Basics: ..... **Error! Bookmark not defined.**

3.5 Supply Chain Digitalization ..... **Error! Bookmark not defined.**

3.6 Data Management in Supply Chains ..... **Error! Bookmark not defined.**

3.7 Blockchain for Supply Chain Traceability ..... **Error! Bookmark not defined.**

IoT and Smart Supply Chains ..... **Error! Bookmark not defined.**

3.8 Security and Privacy in Supply Chain Software: ..... **Error! Bookmark not defined.**

3.9 Case Studies and Real-world Applications ..... **Error! Bookmark not defined.**

4.1 Social Media Marketing for Real Estate, Rental, and Leasing ..... **Error! Bookmark not defined.**

4.1 Social Media Marketing for Real Estate, Rental, and Leasing . **Error! Bookmark not defined.**

4.2 Introduction to Social Media Marketing ..... **Error! Bookmark not defined.**

4.2 Introduction to Social Media Marketing ..... **Error! Bookmark not defined.**

Understanding the basic concepts of social media marketing and its importance in the real estate, rental, and leasing sectors.: Understanding the Basic Concepts of Social Media Marketing ..... **Error! Bookmark not defined.**

Importance of Social Media Marketing in Real Estate, Rental, and Leasing **Error! Bookmark not defined.**

4.3 Target Audience Analysis ..... **Error! Bookmark not defined.**

4.4 Content Creation for Real Estate ..... **Error! Bookmark not defined.**

Strategies for creating compelling content that attracts and retains the interest of potential clients on social media.: Target Audience Analysis for Real Estate, Rental, and Leasing on Social Media ..... **Error! Bookmark not defined.**

4.5 Platform-Specific Strategies: ..... **Error! Bookmark not defined.**

Learning to tailor marketing strategies for different social media platforms such as Facebook, Instagram, and LinkedIn.: Platform-Specific Strategies for Social Media Marketing ..... **Error! Bookmark not defined.**

4.6 Social Media Advertising: ..... **Error! Bookmark not defined.**

Engagement and Community Building: ..... **Error! Bookmark not defined.**

Metrics and Analytics: Engagement and Community Building ..... **Error! Bookmark not defined.**

Case Studies and Best Practices ..... **Error! Bookmark not defined.**

4.6 Case Studies and Best Practices ..... **Error! Bookmark not defined.**

5.1 Advanced Telemedicine and Remote Healthcare Production ..... **Error! Bookmark not defined.**

5.2 Introduction to Telemedicine and Remote Healthcare: Advanced Telemedicine and Remote Healthcare Production ..... **Error! Bookmark not defined.**

5.3 Television and Radio Production Essentials: ..... **Error! Bookmark not defined.**

5.4 Medical Narrative and Storytelling ..... **Error! Bookmark not defined.**

Crafting compelling stories that communicate complex healthcare concepts effectively to a diverse audience.: 5.3 Television and Radio Production Essentials **Error! Bookmark not defined.**

5.6 Remote Healthcare Technologies and Innovations: ..... **Error! Bookmark not defined.**

5.9 Audience Engagement and Feedback in Healthcare Broadcasting **Error! Bookmark not defined.**

5.11 Future Trends in Telemedicine and Media Integration ..... **Error! Bookmark not defined.**

6.1 Technical Writing for Technology ..... **Error! Bookmark not defined.**

6.2 Introduction to Technical Writing ..... **Error! Bookmark not defined.**

6.3 Understanding Your Audience: ..... **Error! Bookmark not defined.**

6.9 Editing and Proofreading: Editing and Proofreading ..... **Error! Bookmark not defined.**

6.10 Ethics in Technical Writing ..... **Error! Bookmark not defined.**

6.10 Ethics in Technical Writing ..... **Error! Bookmark not defined.**

6.12 Effective Communication in Teams ..... **Error! Bookmark not defined.**

7.1.Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology **Error! Bookmark not defined.**

7.2Introduction to Vertical Farming and Urban Agriculture ..... **Error! Bookmark not defined.**

7.3.Fundamentals of Synthetic Biology ..... **Error! Bookmark not defined.**

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are used to optimize plant growth.: Fundamentals of Synthetic Biology ..... **Error! Bookmark not defined.**

7.4..Applications of Synthetic Biology in Urban Agriculture ..... **Error! Bookmark not defined.**

7.6Design of Vertical Farming Systems ..... **Error! Bookmark not defined.**

7.7Integration of Biotechnology in Crop Production ..... **Error! Bookmark not defined.**

7.8.Environmental and Economic Impacts of Urban Agriculture ..... **Error! Bookmark not defined.**

7.9.Regulatory and Ethical Considerations in Synthetic Biology ..... **Error! Bookmark not defined.**

7.10Future Trends in Vertical Farming and Synthetic Biology ..... **Error! Bookmark not defined.**

8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities ..... **Error! Bookmark not defined.**

8.2.Introduction to Urban Water Supply Systems ..... **Error! Bookmark not defined.**

8.3 Sewerage Systems Design and Manage ..... **Error! Bookmark not defined.**

8.3.Sewerage Systems Design and Management ..... **Error! Bookmark not defined.**

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable practices and innovations in waste treatment and resource recovery.: Sewerage Systems Design and Management **Error! Bookmark not defined.**

8.4.Urban Waste Management Strategies ..... **Error! Bookmark not defined.**

8.5.Remediation Activities and Technologies ..... **Error! Bookmark not defined.**

8.6.Policy and Regulation in Urban Water and Waste ..... **Error! Bookmark not defined.**

8.7.Climate Change and its Impact on Water and Waste Management **Error! Bookmark not defined.**

8.8..Sustainable Innovations in Water and Waste Systems ..... **Error! Bookmark not defined.**

9.1.Transportation and Warehousing in Tourism Planning and Development . **Error! Bookmark not defined.**

9.2..Introduction to Tourism Logistics ..... **Error! Bookmark not defined.**

9.3…Transportation Infrastructure in Tourism ..... **Error! Bookmark not defined.**

9.4..Role of Warehousing in Tourism ..... **Error! Bookmark not defined.**

9.5..Sustainable Transport Solutions ..... **Error! Bookmark not defined.**

9.6..Tourism Supply Chain Management ..... **Error! Bookmark not defined.**

9.7.Policy and Regulations in Tourism Transport ..... **Error! Bookmark not defined.**

9.8.Innovations in Tourism Warehousing ..... **Error! Bookmark not defined.**

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations in Tourism Warehousing ..... **Error! Bookmark not defined.**

9.9..Case Studies on Tourism and Logistics ..... **Error! Bookmark not defined.**

10.1..Spatial Computing in Telecommunications ..... **Error! Bookmark not defined.**

10.2..Introduction to Spatial Computing ..... **Error! Bookmark not defined.**

10.3..Spatial Data and Telecommunications ..... **Error! Bookmark not defined.**

10.4..Geographical Information Systems (GIS) in Telecom ..... **Error! Bookmark not defined.**

10.5..Network Planning and Optimization Using Spatial Computing **Error! Bookmark not defined.**

10.6.Spatial Data Analytics for Telecom ..... **Error! Bookmark not defined.**

10.7..Augmented Reality (AR) in Telecommunication Services ..... **Error! Bookmark not defined.**

10.11..5G and Spatial Computing ..... **Error! Bookmark not defined.**

10.12..Privacy and Security in Spatial Telecommunications ..... **Error! Bookmark not defined.**

11.1..Advanced Legal Studies in Public Administration and Safety ..... **Error! Bookmark not defined.**

11.2Introduction to Public Law ..... **Error! Bookmark not defined.**

11.3.Constitutional Law and Governance ..... **Error! Bookmark not defined.**

11.4.Administrative Law ..... **Error! Bookmark not defined.**

11.5.Legal Frameworks for Public Safety ..... **Error! Bookmark not defined.**

11.6..Ethics in Public Administration ..... **Error! Bookmark not defined.**

11.7..Public Policy and Legal Implications ..... **Error! Bookmark not defined.**

11.8..Human Rights and Social Justice ..... **Error! Bookmark not defined.**

11.9.Crisis Management and Legal Compliance ..... **Error! Bookmark not defined.**

12.1Metallurgy in Oil and Gas Production, Refining, and Transport ... **Error! Bookmark not defined.**
12.2..Introduction to Metallurgy in Oil and Gas ..... **Error! Bookmark not defined.**
12.3..Material Selection for Oil and Gas Production ..... **Error! Bookmark not defined.**
12.4..Corrosion Mechanisms and Prevention ..... **Error! Bookmark not defined.**
12.5..Metallurgical Processes in Refining ..... **Error! Bookmark not defined.**
Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance material properties. Corrosion Mechanisms and Prevention ..... **Error! Bookmark not defined.**
12.6..Pipeline Materials and Design ..... **Error! Bookmark not defined.**
12.7.Advanced Coatings and Surface Treatments ..... **Error! Bookmark not defined.**
Advanced Coatings and Surface Treatments ..... **Error! Bookmark not defined.**
12.8.Environmental Impact and Sustainability in Metallurgy ..... **Error! Bookmark not defined.**
12.9..Failure Analysis and Case Studies ..... **Error! Bookmark not defined.**
12.10Future Trends in Metallurgy for Oil and Gas ..... **Error! Bookmark not defined.**
13.1.Integrated Water Management in Mining ..... **Error! Bookmark not defined.**
13.2.Introduction to Mining Water Management ..... **Error! Bookmark not defined.**
13.2.Water Resource Evaluation and Planning ..... **Error! Bookmark not defined.**
13.3.Water Quality Management in Mining ..... **Error! Bookmark not defined.**
13.4.Regulatory and Environmental Compliance ..... **Error! Bookmark not defined.**
13.5.Innovation and Technology in Water Management ..... **Error! Bookmark not defined.**
13.6.Stakeholder Engagement and Social License ..... **Error! Bookmark not defined.**
13.7..Climate Change Impacts on Water Resources ..... **Error! Bookmark not defined.**
13.8.Case Studies and Best Practices ..... **Error! Bookmark not defined.**
13.7.Future Trends in Mining Water Management ..... **Error! Bookmark not defined.**
3.1 Integrated Water Management in Mining ..... **Error! Bookmark not defined.**
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13.3 Water Resource Evaluation and Planning ..... **Error! Bookmark not defined.**
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14.8 Case Studies and Best Practices ..... **Error! Bookmark not defined.**
14.9 Future Trends in Mining Water Management ..... **Error! Bookmark not defined.**
15.1.Advanced Manufacturing Techniques in Genetic Engineering ..... **Error! Bookmark not defined.**
15.2.Introduction to Genetic Engineering ..... **Error! Bookmark not defined.**
15.3..Manufacturing Processes in Biotechnology ..... **Error! Bookmark not defined.**
15.4..CRISPR and Advanced Genetic Modification Techniques ..... **Error! Bookmark not defined.**
15.5.Ethical and Regulatory Considerations ..... **Error! Bookmark not defined.**
15.6.Biopharmaceutical Manufacturing ..... **Error! Bookmark not defined.**
15.7.Fermentation Technology ..... **Error! Bookmark not defined.**
15.8..Scale-Up and Commercialization ..... **Error! Bookmark not defined.**
15.9.Quality Control in Genetically Engineered Products ..... **Error! Bookmark not defined.**
15.10.Future Trends in Genetic Engineering Manufacturing ..... **Error! Bookmark not defined.**
15.1.Advanced Manufacturing Techniques in Genetic Engineering ..... **Error! Bookmark not defined.**

15.2.Introduction to Genetic Engineering ..... **Error! Bookmark not defined.**
15.3..Manufacturing Processes in Biotechnology ..... **Error! Bookmark not defined.**
15.4..CRISPR and Advanced Genetic Modification Techniques ..... **Error! Bookmark not defined.**
15.5.Ethical and Regulatory Considerations ..... **Error! Bookmark not defined.**
15.6.Biopharmaceutical Manufacturing ..... **Error! Bookmark not defined.**
15.7.Fermentation Technology ..... **Error! Bookmark not defined.**
15.8..Scale-Up and Commercialization ..... **Error! Bookmark not defined.**
15.9.Quality Control in Genetically Engineered Products ..... **Error! Bookmark not defined.**
15.10.Future Trends in Genetic Engineering Manufacturing ..... **Error! Bookmark not defined.**
16.1.Data Processing and Hosting Services in Computer Engineering **Error! Bookmark not defined.**
16.2.Introduction to Data Processing ..... **Error! Bookmark not defined.**
16.3.Cloud Hosting Services ..... **Error! Bookmark not defined.**
16.4..Big Data Technologies ..... **Error! Bookmark not defined.**
16.5Data Security in Cloud Hosting ..... **Error! Bookmark not defined.**
16.6.Containerization and Microservices ..... **Error! Bookmark not defined.**
16.7Distributed Systems ..... **Error! Bookmark not defined.**
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16.9..Serverless Computing ..... **Error! Bookmark not defined.**
16.1 Data Processing and Hosting Services in Computer Engineering **Error! Bookmark not defined.**
16.2 Introduction to Data Processing ..... **Error! Bookmark not defined.**
16.3 Cloud Hosting Services ..... **Error! Bookmark not defined.**
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16.5 Data Security in Cloud Hosting ..... **Error! Bookmark not defined.**
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17.1.Masters in Cryptocurrency and Blockchain Applications ..... **Error! Bookmark not defined.**
17.2.Introduction to Blockchain Technology ..... **Error! Bookmark not defined.**
17.2.Cryptocurrencies: An Overview ..... **Error! Bookmark not defined.**
17.3.Blockchain Consensus Mechanisms ..... **Error! Bookmark not defined.**
17.4..Smart Contracts ..... **Error! Bookmark not defined.**

17.5.Decentralized Finance (DeFi) ..... **Error! Bookmark not defined.**
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17.7.Regulation and Compliance in Blockchain ..... **Error! Bookmark not defined.**
17.8.NFTs and Digital Assets ..... **Error! Bookmark not defined.**
17.1 Masters in Cryptocurrency and Blockchain Applications ..... **Error! Bookmark not defined.**
17.2 Introduction to Blockchain Technology ..... **Error! Bookmark not defined.**
17.3 Cryptocurrencies: An Overview ..... **Error! Bookmark not defined.**
17.4 Blockchain Consensus Mechanisms ..... **Error! Bookmark not defined.**
17.5 Smart Contracts ..... **Error! Bookmark not defined.**
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17.7 Blockchain in Supply Chain Management ..... **Error! Bookmark not defined.**
17.8 Regulation and Compliance in Blockchain ..... **Error! Bookmark not defined.**
17.9 NFTs and Digital Assets ..... **Error! Bookmark not defined.**
18.1.Advanced Cybersecurity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.2.Introduction to Cybersecurity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.3Threats and Vulnerabilities in Digital Libraries ..... **Error! Bookmark not defined.**
18.4.Data Privacy and Integrity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.5.Implementing Security Policies for Digital Libraries ..... **Error! Bookmark not defined.**
18.6.Access Control in Library Networks ..... **Error! Bookmark not defined.**
18.7.Digital Rights Management in Bibliotechnology ..... **Error! Bookmark not defined.**
18.8.Network Security Essentials for Digital Libraries ..... **Error! Bookmark not defined.**
18.9.Incident Response and Recovery for Digital Libraries ..... **Error! Bookmark not defined.**
18..10Emerging Cybersecurity Technologies in Bibliotechnology ..... **Error! Bookmark not defined.**
18.1 Advanced Cybersecurity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.2 Introduction to Cybersecurity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.3 Threats and Vulnerabilities in Digital Libraries ..... **Error! Bookmark not defined.**
18.4 Data Privacy and Integrity in Bibliotechnology ..... **Error! Bookmark not defined.**
18.5 Implementing Security Policies for Digital Libraries ..... **Error! Bookmark not defined.**
18.6 Access Control in Library Networks ..... **Error! Bookmark not defined.**
18.7 Digital Rights Management in Bibliotechnology ..... **Error! Bookmark not defined.**
18.8 Network Security Essentials for Digital Libraries ..... **Error! Bookmark not defined.**
18.9 Incident Response and Recovery for Digital Libraries ..... **Error! Bookmark not defined.**

18.10 Emerging Cybersecurity Technologies in Bibliotechnology **Error! Bookmark not defined.**
19.1.1Edge Computing in Modern Power and Energy Systems ..... **Error! Bookmark not defined.**
19.2..Introduction to Edge Computing ..... **Error! Bookmark not defined.**
19.3.Distributed Computing in Energy Systems ..... **Error! Bookmark not defined.**
19.4.IoT Applications in Power Systems ..... **Error! Bookmark not defined.**
19.5.Real-time Data Processing ..... **Error! Bookmark not defined.**
19.6Security and Privacy in Edge Computing ..... **Error! Bookmark not defined.**
19.6.Edge Analytics for Energy Management ..... **Error! Bookmark not defined.**
19.7.Energy Efficiency Optimization ..... **Error! Bookmark not defined.**
19.8.Case Studies on Edge Computing in Energy ..... **Error! Bookmark not defined.**
19.9.Future Trends in Edge Computing for Energy Systems ..... **Error! Bookmark not defined.**
19.1 Edge Computing in Modern Power and Energy Systems ..... **Error! Bookmark not defined.**
19.2 Introduction to Edge Computing ..... **Error! Bookmark not defined.**
19.3 Distributed Computing in Energy Systems ..... **Error! Bookmark not defined.**
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19.7 Edge Analytics for Energy Management ..... **Error! Bookmark not defined.**
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19.9 Case Studies on Edge Computing in Energy ..... **Error! Bookmark not defined.**
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Introduction to Edge Computing ..... **Error! Bookmark not defined.**
Role of Edge Computing in Smart Grids ..... **Error! Bookmark not defined.**
Edge Computing for Renewable Energy Integration ..... **Error! Bookmark not defined.**
Data Management and Security in Edge Computing ..... **Error! Bookmark not defined.**
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20.1.Masters in Cyber-Physical Systems and Information Technology **Error! Bookmark not defined.**
20.2.Introduction to Cyber-Physical Systems ..... **Error! Bookmark not defined.**
20.3.Architecture of CPS ..... **Error! Bookmark not defined.**

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20.6.Machine Learning in CPS ..... **Error! Bookmark not defined.**

20.7.Real-Time Systems and CPS ..... **Error! Bookmark not defined.**

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21.1.Masters in Distributed-Ledger Technology Applications in Educational Technology .**Error! Bookmark not defined.**

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21.2.The Need for Distributed Ledger Technology in Education ..... **Error! Bookmark not defined.**

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21.6.Case Studies of DLT in Education ..... **Error! Bookmark not defined.**

21.7.Future Trends in DLT and EdTech ..... **Error! Bookmark not defined.**

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22.1.Master's in Adult Education Services ..... **Error! Bookmark not defined.**
22.1.Introduction to Adult Education ..... **Error! Bookmark not defined.**
22.2.Theories of Adult Learning ..... **Error! Bookmark not defined.**
22.3.Curriculum Design for Adult Learners ..... **Error! Bookmark not defined.**
22.4.Assessment and Evaluation in Adult Education ..... **Error! Bookmark not defined.**
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23.1Quantum Computing in Systems Engineering ..... **Error! Bookmark not defined.**
23.1.Introduction to Quantum Computing ..... **Error! Bookmark not defined.**
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23.3.Introduction to Neurotechnology ..... **Error! Bookmark not defined.**
23.4.Neuroscience Basics for Educators ..... **Error! Bookmark not defined.**
23.5.Brain-Computer Interfaces in Education ..... **Error! Bookmark not defined.**
23.6.Cognitive Load Theory and Neurotechnology ..... **Error! Bookmark not defined.**
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24.1.Robotic Process Automation in Electrochemical Engineering ..... **Error! Bookmark not defined.**
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24.3.Fundamentals of Electrochemical Engineering ..... **Error! Bookmark not defined.**
24.4.RPA Tools and Platforms ..... **Error! Bookmark not defined.**
24.5.Automating Electrochemical Process Controls ..... **Error! Bookmark not defined.**

24.6.Data Collection and Analysis in Electrochemical Systems ..... **Error! Bookmark not defined.**

24.7.Machine Learning and RPA in Electrochemical Engineering .... **Error! Bookmark not defined.**

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25.1.Integrating Educational Technology in Renewable Energy Studies **Error! Bookmark not defined.**

25.2.Introduction to Renewable Energy ..... **Error! Bookmark not defined.**

25.3.Educational Technology Tools ..... **Error! Bookmark not defined.**

25.4.Designing Interactive Learning Modules ..... **Error! Bookmark not defined.**

25.5.Gamification in Renewable Energy Education ..... **Error! Bookmark not defined.**

25.6.Virtual Labs and Simulations ..... **Error! Bookmark not defined.**

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum .**Error! Bookmark not defined.**

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26.1Wholesale Trade Management in Industrial Engineering ..... **Error! Bookmark not defined.**

26.2.Introduction to Wholesale Trade ..... **Error! Bookmark not defined.**

26.3.Supply Chain Dynamics ..... **Error! Bookmark not defined.**

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29. 1.Advanced Wireless Communications ..... **Error! Bookmark not defined.**

29.2.Introduction to Wireless Communications ..... **Error! Bookmark not defined.**

29.3.Radio Frequency Fundamentals ..... **Error! Bookmark not defined.**

29.4.Wireless Signal Propagation ..... **Error! Bookmark not defined.**

29.5.Multiple Access Techniques ..... **Error! Bookmark not defined.**

29.6.Wireless Networking and Protocols ..... **Error! Bookmark not defined.**

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30.1.Advanced Electrical Engineering in Construction and Civil Engineering **Error! Bookmark not defined.**
30.2. Fundamentals of Electrical Systems in Construction ..... **Error! Bookmark not defined.**
30.3.Electrical Safety Standards and Codes ..... **Error! Bookmark not defined.**
30.4.Integration of Electrical Systems in Building Design ..... **Error! Bookmark not defined.**
30.5Sustainable and Renewable Energy Technologies ..... **Error! Bookmark not defined.**
30.6.Smart Grids and Intelligent Networks ..... **Error! Bookmark not defined.**
30.7.Electrical System Design and Simulation ..... **Error! Bookmark not defined.**
30.8.Power Quality and Energy Management ..... **Error! Bookmark not defined.**
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Introduction to Electrical Systems in Construction ..... **Error! Bookmark not defined.**
Power Distribution in Buildings ..... **Error! Bookmark not defined.**
Lighting Systems and Design ..... **Error! Bookmark not defined.**
Electrical Safety Standards and Regulations ..... **Error! Bookmark not defined.**

Sustainability in Electrical Engineering ..... **Error! Bookmark not defined.**
Smart Buildings and IoT Integration ..... **Error! Bookmark not defined.**
Electrical Load Analysis and Estimation ..... **Error! Bookmark not defined.**
Integration of Renewable Energy Sources ..... **Error! Bookmark not defined.**
Project Management in Electrical Engineering ..... **Error! Bookmark not defined.**
30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering ..... **Error! Bookmark not defined.**
30.2.Advanced Power System Analysis ..... **Error! Bookmark not defined.**
30.3Renewable Energy Systems ..... **Error! Bookmark not defined.**
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31.5.Smart Grids and IoT Applications ..... **Error! Bookmark not defined.**
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31.1Sustainable Electrical Engineering Practices ..... **Error! Bookmark not defined.**
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31.9 Sustainable Electrical Engineering Practices ..... **Error! Bookmark not defined.**
Admission Ready - Completing your application - Atlantic International University **Error! Bookmark not defined.**
32.Topic ..... **Error! Bookmark not defined.**
32.1Clean Energy Technology: Ecotechnology Applications ..... **Error! Bookmark not defined.**
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32.5.Wind Energy Systems ..... **Error! Bookmark not defined.**
32.6.Bioenergy and Biomass ..... **Error! Bookmark not defined.**

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33.2.Introduction to Electronic Systems in Civil Engineering ..... **Error! Bookmark not defined.**
33.3.Smart Construction Technologies ..... **Error! Bookmark not defined.**
33.4.IoT in Infrastructure Management ..... **Error! Bookmark not defined.**
33.5.Electronic Monitoring and Control Systems ..... **Error! Bookmark not defined.**
33.6.Automation in Construction Machinery ..... **Error! Bookmark not defined.**
33.7.Solar and Renewable Energy Systems in Civil Engineering ..... **Error! Bookmark not defined.**
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35.2.Advanced Cyber-Physical Systems in Telecommunications ..... **Error! Bookmark not defined.**

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35.4.Network Architecture in CPS ..... **Error! Bookmark not defined.**

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35.8.Machine Learning in Cyber-Physical Systems ..... **Error! Bookmark not defined.**

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38. Topics: ..... **Error! Bookmark not defined.**

39. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering ..... **Error! Bookmark not defined.**

36.1.Introduction to Artificial Intelligence and Machine Learning .. **Error! Bookmark not defined.**

36.2.Data Preprocessing and Feature Engineering ..... **Error! Bookmark not defined.**

36.3.Supervised Learning Techniques ..... **Error! Bookmark not defined.**

36.4.Unsupervised Learning and Clustering ..... **Error! Bookmark not defined.**

36.5.Deep Learning and Neural Networks ..... **Error! Bookmark not defined.**

36.6.Natural Language Processing ..... **Error! Bookmark not defined.**
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37.7 Natural Language Processing ..... **Error! Bookmark not defined.**
37.8 AI/ML in Software Development Lifecycle ..... **Error! Bookmark not defined.**
37.9 Ethical and Responsible AI ..... **Error! Bookmark not defined.**
37.10 Deployment and Scaling of AI Solutions ..... **Error! Bookmark not defined.**
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37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering ..... **Error! Bookmark not defined.**
37.1.Introduction to Autonomous Systems ..... **Error! Bookmark not defined.**
37.2Electric Vehicle Engineering Basics ..... **Error! Bookmark not defined.**
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37.5.Communication Networks and IoT ..... **Error! Bookmark not defined.**
37.6.Control Systems for Autonomous Vehicles ..... **Error! Bookmark not defined.**
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37.9.Integration of Renewable Energy in Autonomous Systems ..... **Error! Bookmark not defined.**
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37.10 Integration of Renewable Energy in Autonomous Systems **Error! Bookmark not defined.**
38.1.topics ..... **Error! Bookmark not defined.**
38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering **Error! Bookmark not defined.**
38.3.Introduction to Electrochemical Engineering ..... **Error! Bookmark not defined.**
38.4.Battery Technologies for Infrastructure ..... **Error! Bookmark not defined.**
38.5.Fuel Cells and Their Applications ..... **Error! Bookmark not defined.**
38.6.and Its Prevention ..... **Error! Bookmark not defined.**
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.38.10.Advanced Topics in Electrochemical Engineering ..... **Error! Bookmark not defined.**
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40.4.Design and Functionality of Battery Cells ..... **Error! Bookmark not defined.**
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41.2.Advanced Robotic Process Automation in Electrical Engineering **Error! Bookmark not defined.**
41.3.Introduction to Robotic Process Automation ..... **Error! Bookmark not defined.**
41.4.RPA Tools and Technologies ..... **Error! Bookmark not defined.**
41.5.Automating Electrical Design Processes ..... **Error! Bookmark not defined.**
41.6.Data Migration and Management ..... **Error! Bookmark not defined.**
41.7.RPA in Control Systems ..... **Error! Bookmark not defined.**
41.8.Machine Learning and RPA ..... **Error! Bookmark not defined.**
41.9.RPA and IoT in Electrical Systems ..... **Error! Bookmark not defined.**
41.10.Security and Ethics in RPA ..... **Error! Bookmark not defined.**
1.2 Advanced Robotic Process Automation in Electrical Engineering . **Error! Bookmark not defined.**
41.3 Introduction to Robotic Process Automation ..... **Error! Bookmark not defined.**
41.4 RPA Tools and Technologies ..... **Error! Bookmark not defined.**
41.5 Automating Electrical Design Processes ..... **Error! Bookmark not defined.**
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41.8 Machine Learning and RPA ..... **Error! Bookmark not defined.**
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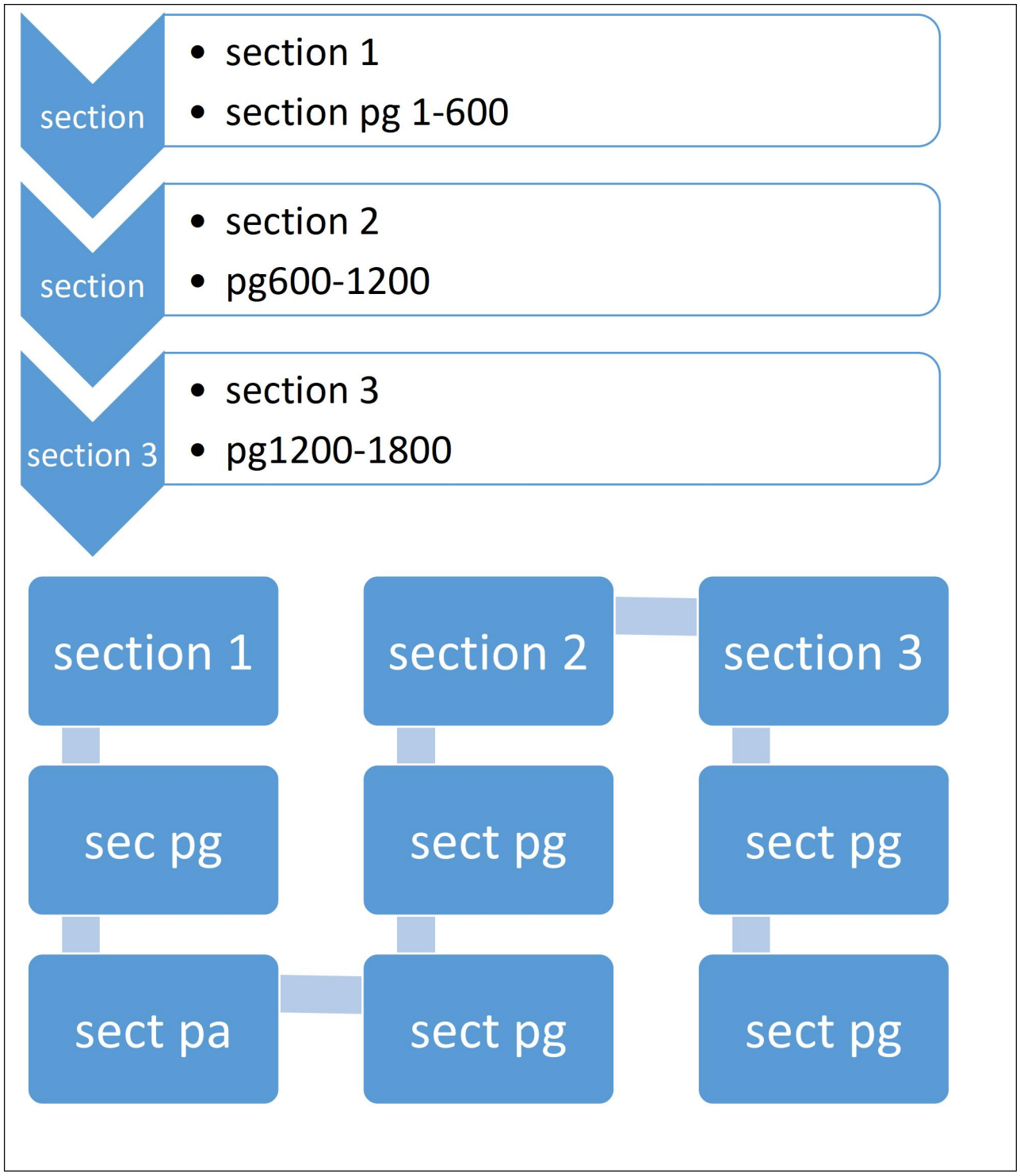
41.10 Security and Ethics in RPA ..... **Error! Bookmark not defined.**
44..1. Define the Problem ..... **Error! Bookmark not defined.**
2. Develop the Mathematical Model ..... **Error! Bookmark not defined.**
3. Simplify the Equations ..... **Error! Bookmark not defined.**
4. Analytical Solution (if possible) ..... **Error! Bookmark not defined.**
5. Numerical Solution (if necessary) ..... **Error! Bookmark not defined.**
6. Simulation and Validation ..... **Error! Bookmark not defined.**
7. Optimization (if applicable) ..... **Error! Bookmark not defined.**
Example Calculation: Load Flow Analysis in Power Systems ..... **Error! Bookmark not defined.**
1. Circuit Analysis ..... **Error! Bookmark not defined.**
2. Electromagnetics ..... **Error! Bookmark not defined.**

3. Signal Processing ..... **Error! Bookmark not defined.**
4. Control Systems ..... **Error! Bookmark not defined.**
5. Power Systems ..... **Error! Bookmark not defined.**
6. Electronics ..... **Error! Bookmark not defined.**
7. Digital Systems ..... **Error! Bookmark not defined.**
8. Communication Systems ..... **Error! Bookmark not defined.**
9. Renewable Energy Systems ..... **Error! Bookmark not defined.**
1. Circuit Analysis ..... **Error! Bookmark not defined.**
2. Electromagnetics ..... **Error! Bookmark not defined.**
3. Signal Processing ..... **Error! Bookmark not defined.**
4. Control Systems ..... **Error! Bookmark not defined.**
5. Power Systems ..... **Error! Bookmark not defined.**
6. Electronics ..... **Error! Bookmark not defined.**
7. Digital Systems ..... **Error! Bookmark not defined.**
8. Communication Systems ..... **Error! Bookmark not defined.**
9. Renewable Energy Systems ..... **Error! Bookmark not defined.**
. Circuit Design and Analysis ..... **Error! Bookmark not defined.**
2. Power Systems Engineering ..... **Error! Bookmark not defined.**
3. Control Systems ..... **Error! Bookmark not defined.**
4. Communication Systems ..... **Error! Bookmark not defined.**
5. Electronics and Semiconductor Design ..... **Error! Bookmark not defined.**
6. Renewable Energy Systems ..... **Error! Bookmark not defined.**
7. Building and Infrastructure ..... **Error! Bookmark not defined.**
8. Biomedical Engineering ..... **Error! Bookmark not defined.**
1. Signal Processing ..... **Error! Bookmark not defined.**
2. Communication Systems ..... **Error! Bookmark not defined.**
3. Information Theory ..... **Error! Bookmark not defined.**
4. Network Theory ..... **Error! Bookmark not defined.**
5. Electromagnetic Theory ..... **Error! Bookmark not defined.**
6. Digital Communication ..... **Error! Bookmark not defined.**
1. Signal Processing ..... **Error! Bookmark not defined.**
2. Communication Systems ..... **Error! Bookmark not defined.**

3. Information Theory ..... **Error! Bookmark not defined.**
4. Network Theory ..... **Error! Bookmark not defined.**
5. Electromagnetic Theory ..... **Error! Bookmark not defined.**
6. Digital Communication ..... **Error! Bookmark not defined.**
Practical Examples: ..... **Error! Bookmark not defined.**
IoT (Internet of Things) ..... **Error! Bookmark not defined.**
Solar Power Systems ..... **Error! Bookmark not defined.**
Wind Energy Projects ..... **Error! Bookmark not defined.**
Communication Systems Calculations ..... **Error! Bookmark not defined.**
1. MIMO (Multiple Input Multiple Output) Systems ..... **Error! Bookmark not defined.**
2. Satellite Communication ..... **Error! Bookmark not defined.**
3. Optical Fiber Communication ..... **Error! Bookmark not defined.**
4. IoT (Internet of Things) ..... **Error! Bookmark not defined.**
Ancient Times ..... **Error! Bookmark not defined.**
System Design and Operation ..... **Error! Bookmark not defined.**
Battery Technologies for Infrastructure ..... **Error! Bookmark not defined.**
34.6 Performance Benefits of Immutable Data ..... **Error! Bookmark not defined.**
38.7 Electrochemical Sensors and Monitoring ..... **Error! Bookmark not defined.**
38.8 Electrolysis and Industrial Processes ..... **Error! Bookmark not defined.**
38.9 Sustainability and Electrochemical Engineering ..... **Error! Bookmark not defined.**
5. Automating Electrical Design Processes ..... **Error! Bookmark not defined.**
Integral and Derivative Calculations in Automating Electrical Design Processes **Error! Bookmark not defined.**
Project Management in Electrical Engineering ..... **Error! Bookmark not defined.**
Integral and Derivative Calculations in Project Management ..... **Error! Bookmark not defined.**
Wind Energy, Solar Energy, and Hydroelectric Power ..... **Error! Bookmark not defined.**
Electrical Infrastructure Design and Management ..... **Error! Bookmark not defined.**
Smart Grids and IoT Applications ..... **Error! Bookmark not defined.**
Understanding the Basic Concepts of Social Media Marketing .... **Error! Bookmark not defined.**
Television and Radio Production Essentials ..... **Error! Bookmark not defined.**
Roberto Aldrett - AIU ..... **Error! Bookmark not defined.**
Career Coach ..... **Error! Bookmark not defined.**
Life-Coach Consulting ..... **Error! Bookmark not defined.**

Master in Modern Power and Energy Systems ..... **Error! Bookmark not defined.**
Master in Renewable Energy ..... **Error! Bookmark not defined.**
Bibliographic Resources ..... **Error! Bookmark not defined.**
The Future Of Science and Engineering ..... **Error! Bookmark not defined.**
The Constantly Changing Education Landscape ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
Core Courses and Topics in Engineering Systems: ..... **Error! Bookmark not defined.**
Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
Core Courses and Topics in Engineering Systems: ..... **Error! Bookmark not defined.**
Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Academic Freedom to Discover Your Purpose Open Curriculum Design at Atlantic International University ..... **Error! Bookmark not defined.**
Core Courses and Topics in Engineering Systems: ..... **Error! Bookmark not defined.**
Orientation Courses: ..... **Error! Bookmark not defined.**
Research Project in Engineering Systems: ..... **Error! Bookmark not defined.**
Courses and Topics in Doctorate in Electrical Engineering ..... **Error! Bookmark not defined.**
Orientation Course ..... **Error! Bookmark not defined.**
Research Projects in Doctorate in Electrical Engineering ..... **Error! Bookmark not defined.**
Thesis. Degree honor, council quality rules low become justice development court and labor relations conciliation mediation, Engineering electrical trade research policy skill ,safety security order develop ,defense order ..... **Error! Bookmark not defined.**
Contact Information and Admission call – Atlantic International University **Error! Bookmark not defined.**
Course Ciriculum Total Course Thesis Alumine(1) ..... **Error! Bookmark not defined.**
Reviews (1) ..... **Error! Bookmark not defined.**
Re: FW: Article submission received #TrackingId:21365851 ..... **Error! Bookmark not defined.**
Your article submission 161981 ..... **Error! Bookmark not defined.**
editorial@f1000research.com ..... **Error! Bookmark not defined.**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section 2
pg600-1200
section 3
section 3
pg1200-1800
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section2 pg

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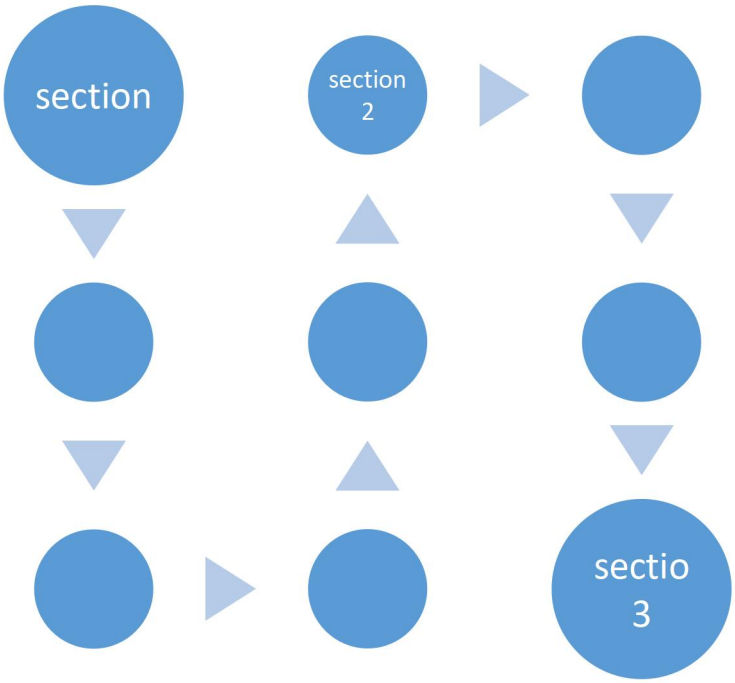
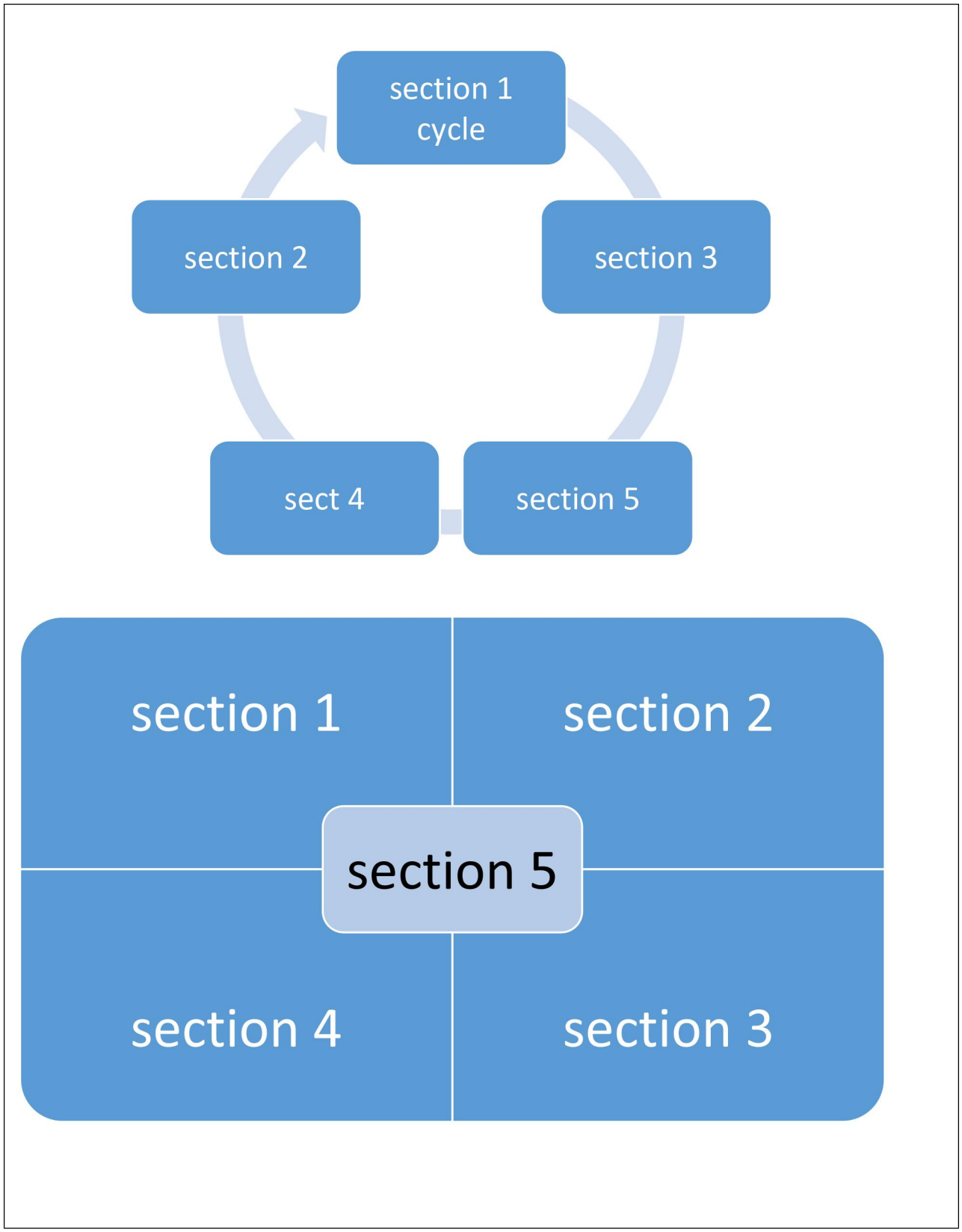
section 3

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section 2
section 3
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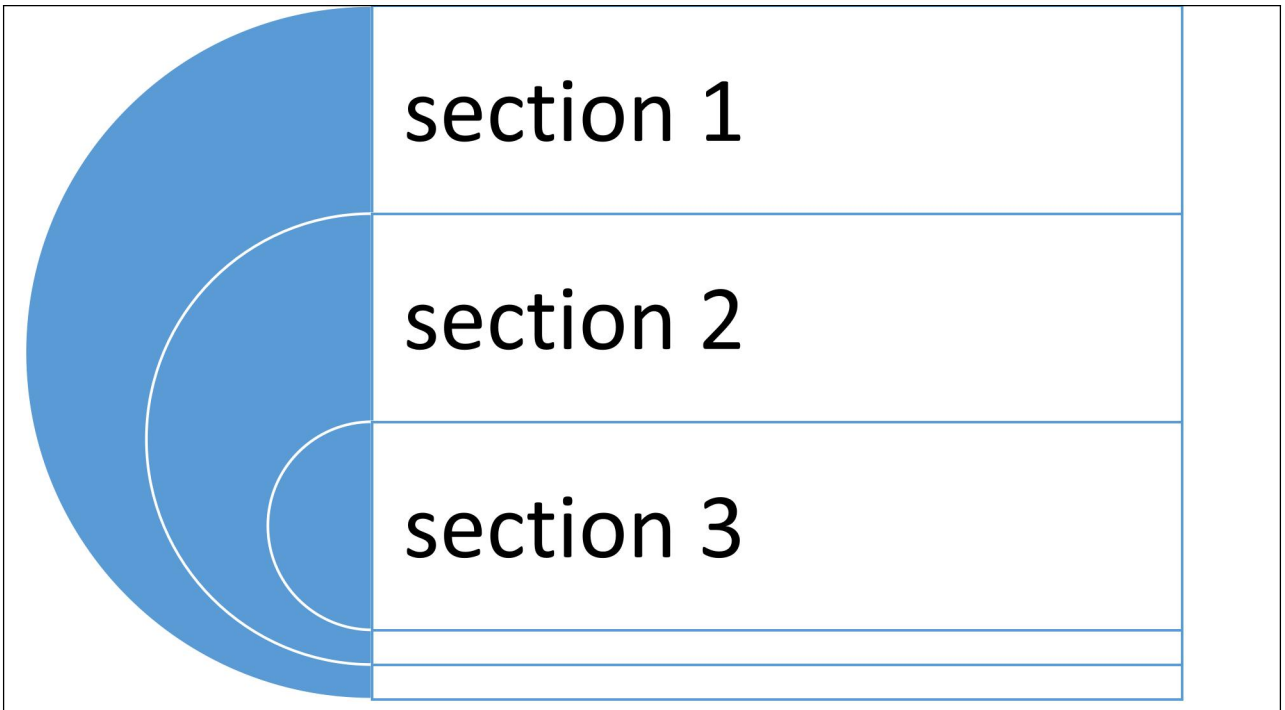
section 5
section 1
section 2
section 5
section 4
section 3


section 1
section 2
section 3

```
file:///C:/Users/Library%20SIX/Desktop/UserForm12%20tshingombe.frm
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm12
   Caption         =   "UserForm12"
   ClientHeight    =   7164
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   16356
   OleObjectBlob   =   "UserForm12 tshingombe.frx":0000
   StartUpPosition =   1  'CenterOwner
End
Attribute VB_Name = "UserForm12"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub Frame3_Click()
```

```
End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label10_Click()

End Sub

Private Sub Label12_Click()

End Sub

Private Sub Label13_Click()

End Sub

Private Sub Label15_Click()

End Sub

Private Sub Label6_Click()

End Sub

Private Sub Label7_Click()

End Sub

Private Sub Label9_Click()

End Sub

Private Sub ListBox1_Click()

End Sub

Private Sub ListBox3_Click()

End Sub

Private Sub ListBox4_Click()

End Sub

Private Sub MultiPage1_Change()

End Sub

Private Sub TextBox1_Change()

End Sub

Private Sub UserForm_Click()
```

```
End Sub
```

---

file:///C:/Users/Library%20SIX/Desktop/UserForm1%20tshingombe%20equation.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm1
   Caption         =   "UserForm1"
   ClientHeight    =   6840
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19248
   OleObjectBlob   =   "UserForm1 tshingombe equation.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False

Private Sub CommandButton1_Click()

End Sub

Private Sub CommandButton2_Click()

End Sub

Private Sub CommandButton3_Click()

End Sub

Private Sub Frame1_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label3_Click()

End Sub

Private Sub Label5_Click()

End Sub

Private Sub TextBox1_Change()

End Sub

Private Sub TextBox2_Change()
```

```
End Sub

Private Sub TextBox3_Change()

End Sub

Private Sub TextBox4_AfterUpdate()

End Sub

Private Sub TextBox4_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
DragState As MSForms.fmDragState, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox4_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Action As MSForms.fmAction, ByVal Data As MSForms.DataObject, ByVal X
As Single, ByVal Y As Single, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox4_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub TextBox4_Change()

End Sub

Private Sub TextBox4_DblClick(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub TextBox4_DropButtonClick()

End Sub

Private Sub TextBox4_Enter()

End Sub

Private Sub TextBox4_Exit(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub TextBox4_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub TextBox4_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub
```

```
Private Sub TextBox4_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub TextBox4_MouseDown(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox4_MouseMove(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox4_MouseUp(ByVal Button As Integer, ByVal Shift As Integer,
ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub UserForm_Click()

End Sub
```

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} frm1
   Caption         =   "UserForm1"
   ClientHeight    =   8664
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19884
   OleObjectBlob   =   "frm1tshingombe.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "frm1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub ComboBox1_Change()

End Sub

Private Sub ComboBox2_Change()

End Sub

Private Sub ComboBox3_Change()

End Sub

Private Sub ComboBox4_Change()

End Sub

Private Sub ComboBox5_Change()
```

```
End Sub

Private Sub CommandButton1_Click()

End Sub

Private Sub CommandButton2_Click()

End Sub

Private Sub CommandButton3_Click()

End Sub

Private Sub Frame1_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label2_Click()

End Sub

Private Sub Label3_Click()

End Sub

Private Sub Label5_Click()

End Sub

Private Sub Label6_Click()

End Sub

Private Sub TextBox1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
DragState As MSForms.fmDragState, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Action As MSForms.fmAction, ByVal Data As MSForms.DataObject, ByVal X
As Single, ByVal Y As Single, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_Change()

End Sub
```

```
Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub TextBox1_DropButtonClick()

End Sub

Private Sub TextBox1_Enter()

End Sub

Private Sub TextBox1_Error(ByVal Number As Integer, ByVal Description As
MSForms.ReturnString, ByVal SCode As Long, ByVal Source As String, ByVal
HelpFile As String, ByVal HelpContext As Long, ByVal CancelDisplay As
MSForms.ReturnBoolean)

End Sub

Private Sub TextBox1_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub

Private Sub TextBox1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_MouseDown(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox1_MouseMove(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox1_MouseUp(ByVal Button As Integer, ByVal Shift As Integer,
ByVal X As Single, ByVal Y As Single)

End Sub
```

---

file:///C:/Users/Library%20SIX/Desktop/frm1tshingombe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} frm1
   Caption         =   "UserForm1"
   ClientHeight    =   8664
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19884
   OleObjectBlob   =   "frm1tshingombe.frx":0000
```

```
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "frm1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub ComboBox1_Change()

End Sub

Private Sub ComboBox2_Change()

End Sub

Private Sub ComboBox3_Change()

End Sub

Private Sub ComboBox4_Change()

End Sub

Private Sub ComboBox5_Change()

End Sub

Private Sub CommandButton1_Click()

End Sub

Private Sub CommandButton2_Click()

End Sub

Private Sub CommandButton3_Click()

End Sub

Private Sub Frame1_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label2_Click()

End Sub

Private Sub Label3_Click()

End Sub
```

```
Private Sub Label5_Click()

End Sub

Private Sub Label6_Click()

End Sub

Private Sub TextBox1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
DragState As MSForms.fmDragState, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Action As MSForms.fmAction, ByVal Data As MSForms.DataObject, ByVal X
As Single, ByVal Y As Single, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_Change()

End Sub

Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub TextBox1_DropButtonClick()

End Sub

Private Sub TextBox1_Enter()

End Sub

Private Sub TextBox1_Error(ByVal Number As Integer, ByVal Description As
MSForms.ReturnString, ByVal SCode As Long, ByVal Source As String, ByVal
HelpFile As String, ByVal HelpContext As Long, ByVal CancelDisplay As
MSForms.ReturnBoolean)

End Sub

Private Sub TextBox1_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub TextBox1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub

Private Sub TextBox1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)
```

```
End Sub

Private Sub TextBox1_MouseDown(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox1_MouseMove(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub TextBox1_MouseUp(ByVal Button As Integer, ByVal Shift As Integer,
ByVal X As Single, ByVal Y As Single)

End Sub
```

---

file:///C:/Users/Library%20SIX/Desktop/UserForm3tshingombe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
   Caption         =   "UserForm3"
   ClientHeight    =   7476
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19812
   OleObjectBlob   =   "UserForm3tshingombe.frx":0000
   StartUpPosition =   3  'Windows Default
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm3"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False

Private Sub ComboBox1_Change()

End Sub

Private Sub CommandButton1_Click()

End Sub

Private Sub CommandButton2_Click()

End Sub

Private Sub CommandButton3_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub ListBox1_Click()
```

```
End Sub

Private Sub SpinButton1_AfterUpdate()

End Sub

Private Sub SpinButton1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
DragState As MSForms.fmDragState, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub SpinButton1_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub SpinButton1_Change()

End Sub

Private Sub SpinButton1_Enter()

End Sub

Private Sub SpinButton1_Exit(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub SpinButton1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub

Private Sub SpinButton1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub SpinButton1_SpinDown()

End Sub
```

---

file:///C:/Users/Library%20SIX/Desktop/UserForm3tshingombe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
   Caption         =   "UserForm3"
   ClientHeight    =   7476
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19812
   OleObjectBlob   =   "UserForm3tshingombe.frx":0000
   StartUpPosition =   3  'Windows Default
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm3"
```

```
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False

Private Sub ComboBox1_Change()

End Sub

Private Sub CommandButton1_Click()

End Sub

Private Sub CommandButton2_Click()

End Sub

Private Sub CommandButton3_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub ListBox1_Click()

End Sub

Private Sub SpinButton1_AfterUpdate()

End Sub

Private Sub SpinButton1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
DragState As MSForms.fmDragState, ByVal Effect As MSForms.ReturnEffect, ByVal
Shift As Integer)

End Sub

Private Sub SpinButton1_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub SpinButton1_Change()

End Sub

Private Sub SpinButton1_Enter()

End Sub

Private Sub SpinButton1_Exit(ByVal Cancel As MSForms.ReturnBoolean)

End Sub

Private Sub SpinButton1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
```

```
End Sub

Private Sub SpinButton1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub SpinButton1_SpinDown()

End Sub
```

---

file:///C:/Users/Library%20SIX/Desktop/UserForm8%20tshingmbe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm8
   Caption         =   "UserForm8"
   ClientHeight    =   7908
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19488
   OleObjectBlob   =   "UserForm8 tshingmbe.frx":0000
   StartUpPosition =   1  'CenterOwner
End
Attribute VB_Name = "UserForm8"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

---

file:///C:/Users/Library%20SIX/Desktop/UserForm9%20tshingombe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm5
   Caption         =   "UserForm5"
   ClientHeight    =   10020
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19728
   OleObjectBlob   =   "UserForm5tshingombe.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm5"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub ComboBox1_Change()

End Sub

Private Sub UserForm_Activate()

End Sub

Private Sub UserForm_AddControl(ByVal Control As MSForms.Control)
```

```
End Sub

Private Sub UserForm_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Control As MSForms.Control, ByVal Action As MSForms.fmAction, ByVal
Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
Effect As MSForms.ReturnEffect, ByVal Shift As Integer)

End Sub

Private Sub UserForm_Click()

End Sub

Private Sub UserForm_Error(ByVal Number As Integer, ByVal Description As
MSForms.ReturnString, ByVal SCode As Long, ByVal Source As String, ByVal
HelpFile As String, ByVal HelpContext As Long, ByVal CancelDisplay As
MSForms.ReturnBoolean)

End Sub

Private Sub UserForm_Initialize()

End Sub

Private Sub UserForm_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub UserForm_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub

Private Sub UserForm_MouseDown(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub UserForm_MouseUp(ByVal Button As Integer, ByVal Shift As Integer,
ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub UserForm_RemoveControl(ByVal Control As MSForms.Control)

End Sub

Private Sub UserForm_Resize()

End Sub

Private Sub UserForm_Terminate()

End Sub
```


Private Sub ComboBox1_Change()

```
End Sub
Private Sub ComboBox2_Change()
End Sub
Private Sub ComboBox3_Change()
End Sub
Private Sub ComboBox4_Change()
End Sub
Private Sub ComboBox5_Change()
End Sub
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label2_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub Label6_Click()
End Sub
Private Sub TextBox1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.DataO
bject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect As M
SForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Action As
MSForms.
fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal Effect As MSFo
rms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)frm1 - 2
End Sub
Private Sub TextBox1_DropButtonClick()
End Sub
Private Sub TextBox1_Enter()
End Sub
Private Sub TextBox1_Error(ByVal Number As Integer, ByVal Description As MSForms.ReturnString, ByVal S
Code As Long, ByVal Source As String, ByVal HelpFile As String, ByVal HelpContext As Long, ByVal Cance
lDisplay As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox1_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub TextBox1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
```

```
al Y As Single)
End Sub
Private Sub TextBox1_MouseMove(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox1_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End SubUserForm1 - 1
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox2_Change()
End Sub
Private Sub TextBox3_Change()
End Sub
Private Sub TextBox4_AfterUpdate()
End Sub
Private Sub TextBox4_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.DataO
bject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect As M
SForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Action As
MSForms.
fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal Effect As MSFo
rms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_Change()
End Sub
Private Sub TextBox4_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_DropButtonClick()
End SubUserForm1 - 2
Private Sub TextBox4_Enter()
End Sub
Private Sub TextBox4_Exit(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
```

```
Private Sub TextBox4_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox4_MouseMove(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox4_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End Sub
Private Sub UserForm_Click()
End SubUserForm3 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub ListBox1_Click()
End Sub
Private Sub SpinButton1_AfterUpdate()
End Sub
Private Sub SpinButton1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.Da
taObject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect A
s MSForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub SpinButton1_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub SpinButton1_Change()
End Sub
Private Sub SpinButton1_Enter()
End Sub
Private Sub SpinButton1_Exit(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub SpinButton1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub SpinButton1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub SpinButton1_SpinDown()
End SubUserForm5 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub UserForm_Activate()
End Sub
Private Sub UserForm_AddControl(ByVal Control As MSForms.Control)
End Sub
Private Sub UserForm_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Control As
MSForms
.Control, ByVal Action As MSForms.fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal
Y As Single, ByVal Effect As MSForms.ReturnEffect, ByVal Shift As Integer)
```

```
End Sub
Private Sub UserForm_Click()
End Sub
Private Sub UserForm_Error(ByVal Number As Integer, ByVal Description As MSForms.ReturnString, ByVal S
Code As Long, ByVal Source As String, ByVal HelpFile As String, ByVal HelpContext As Long, ByVal Cance
lDisplay As MSForms.ReturnBoolean)
End Sub
Private Sub UserForm_Initialize()
End Sub
Private Sub UserForm_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub UserForm_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub UserForm_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub UserForm_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End Sub
Private Sub UserForm_RemoveControl(ByVal Control As MSForms.Control)
End Sub
Private Sub UserForm_Resize()
End Sub
Private Sub UserForm_Terminate()
End SubUserForm7 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub ComboBox2_Change()
End Sub
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub CommandButton5_Click()
End Sub
Private Sub CommandButton6_Click()
End Sub
Private Sub CommandButton8_Click()
End Sub
Private Sub CommandButton9_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label2_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub ListBox1_Click()
End Sub
Private Sub ScrollBar1_Change()
End Sub
Private Sub UserForm_Activate()
```

End Sub
Private Sub UserForm_Click()
End SubNewMacros - 1
Sub fgm()
'
' fgm Macro
'
'
End Sub

UserForm11 - 1
Private Sub Label6_Click()
End Submarketing research ,scope definition plan
define research objective
define research requirement
determine , selection criteria
development vendor criteria , development statemt
evaluate proposal, develom
CommandButton7
owner
days
start
end
Frame1project name
Label5

UserForm12 - 1

Private Sub Frame3_Click()

End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label10_Click()

End Sub

Private Sub Label12_Click()

End Sub

Private Sub Label13_Click()

End Sub

Private Sub Label15_Click()

End Sub

Private Sub Label6_Click()

End Sub

Private Sub Label7_Click()

End Sub

Private Sub Label9_Click()

End Sub

```
Private Sub ListBox1_Click()
End Sub
Private Sub ListBox3_Click()
End Sub
Private Sub ListBox4_Click()
End Sub
Private Sub MultiPage1_Change()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub UserForm_Click()
End Subbook
```

production

schedule

chapiter 1

chapiter 2

chapiter 3

Lchapiter 4

chapiter 5

working day budjet

technial review

content review

graphic

draft

layout

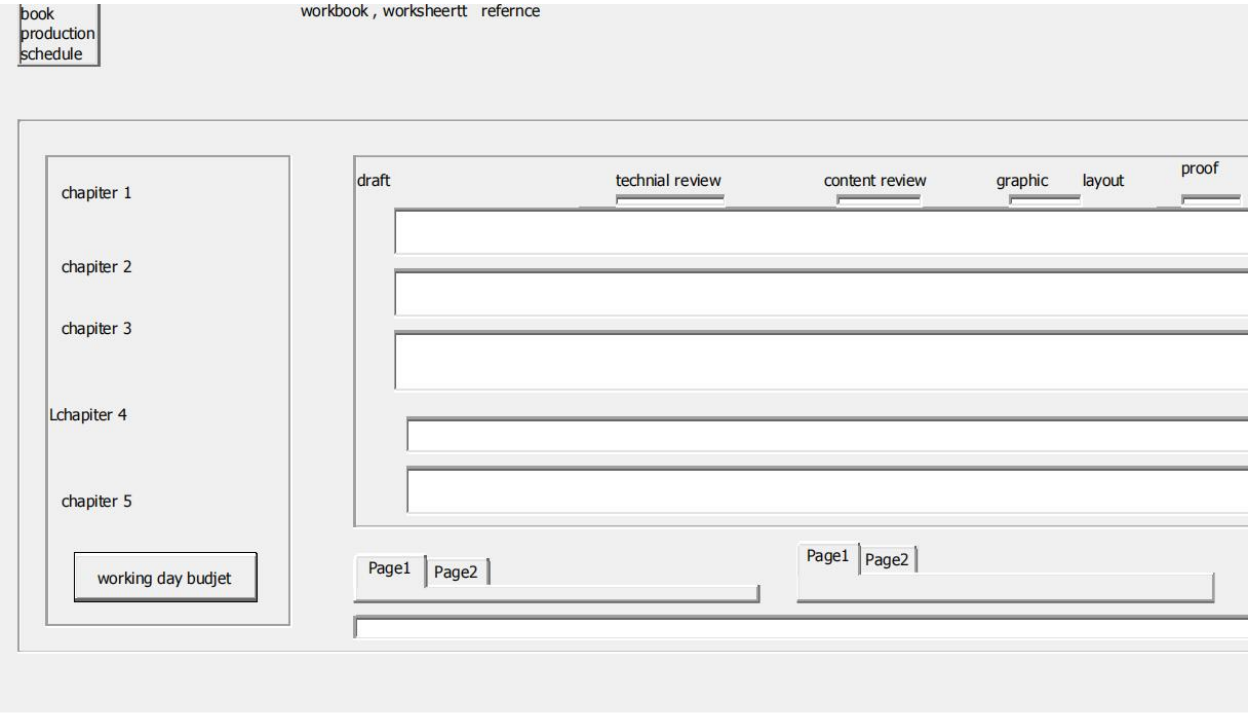
proof

Page1

Page2

Page1 Page2

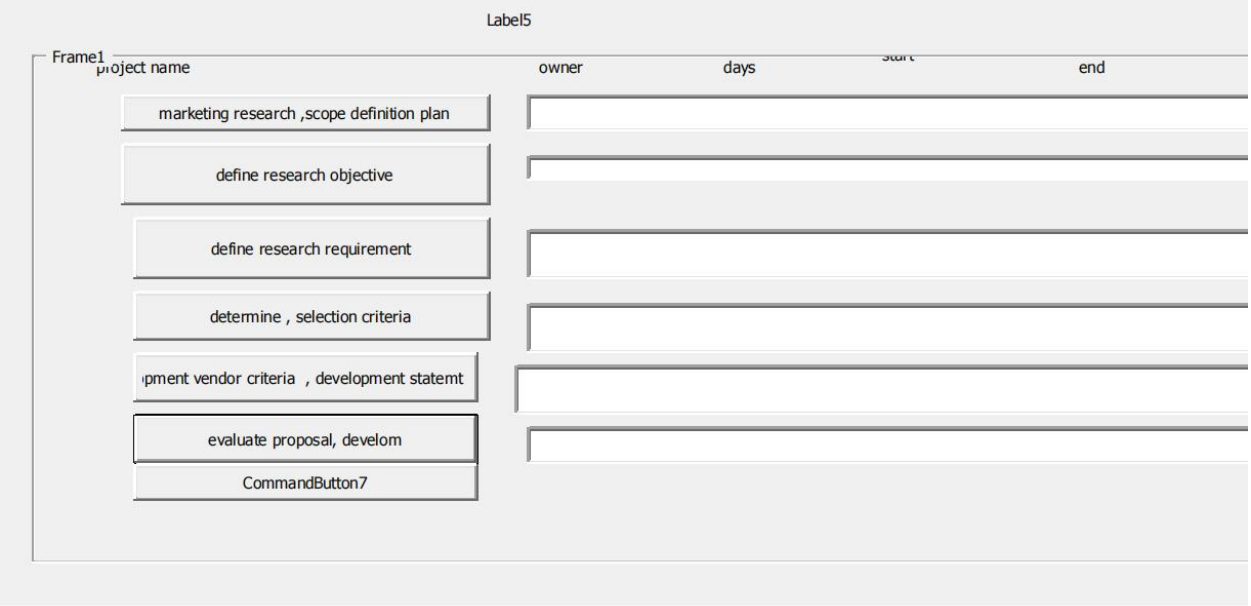
workbook , worksheertt reference



UserForm9 - 1

Private Sub ComboBox2_Change()
End Submark citation
deveoping nation
next citation
mark
mark all
CommandButton4
Frame1
OptionButton1

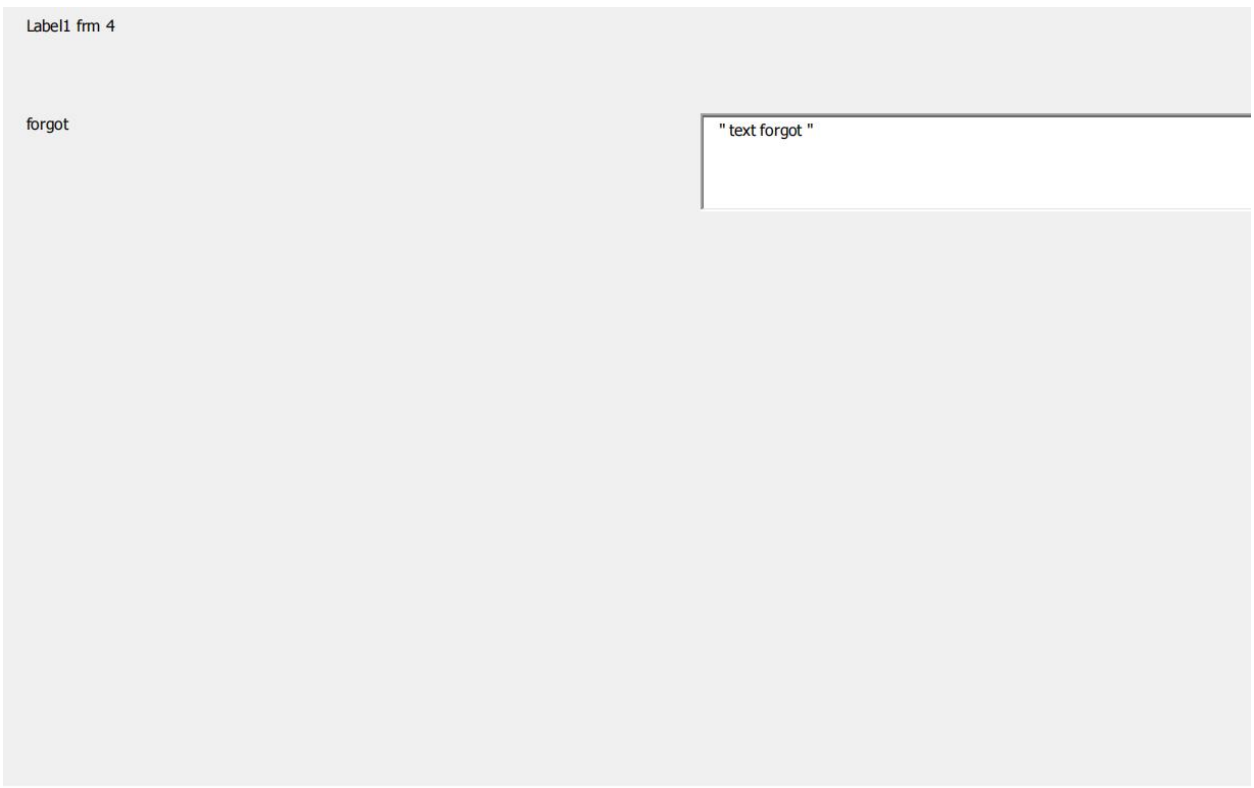
UserForm11 - 1
Private Sub Label6_Click()
End Sub



UserForm12 - 1

```
Private Sub Frame3_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label10_Click()
End Sub
Private Sub Label12_Click()
End Sub
Private Sub Label13_Click()
End Sub
Private Sub Label15_Click()
End Sub
Private Sub Label6_Click()
End Sub
Private Sub Label7_Click()
End Sub
Private Sub Label9_Click()
End Sub
Private Sub ListBox1_Click()
End Sub
Private Sub ListBox3_Click()
End Sub
Private Sub ListBox4_Click()
End Sub
Private Sub MultiPage1_Change()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub UserForm_Click()
End Sub
```

book production schedule
workbook , worksheertt refernce
chapiter 1
chapiter 2
chapiter 3
Lchapiter 4
chapiter 5
working day budjet
draft
technial review
content review
graphic
layout
proof
Page1
Page2
Page1
Page2


Label1 frm 4
forgot
" text forgot "

Frame1
search
author
title
years
city
Lpublished
C

Frame1
search
author
title
years
city
Lpublished
c

file:///C:/Users/Library%20SIX/Desktop/EXCELL%20UserForm3%20TSHINGOMBE.frm

file:///C:/Users/Library%20SIX/Desktop/EXCELL%20UserForm1TSHIN.frm%20FORM.pdf%202.pdf34.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
   Caption         =   "UserForm3"
   ClientHeight    =   6864
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   16140
   OleObjectBlob   =   "EXCELL UserForm3 TSHINGOMBE.frx":0000
   StartUpPosition =   1  'CenterOwner
End
Attribute VB_Name = "UserForm3"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
   Caption         =   "UserForm3"
   ClientHeight    =   6864
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   16140
   OleObjectBlob   =   "EXCELL UserForm1TSHIN.frm FORM.pdf 2.pdf34.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm3"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
   Caption         =   "UserForm3"
   ClientHeight    =   6864
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   16140
   OleObjectBlob   =   "EXCELL UserForm1TSHIN.frm FORM.pdf 2.pdf34.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
```

```
Attribute VB_Name = "UserForm3"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

file:///C:/Users/Library%20SIX/Desktop/EXCELL%20UserForm1TSHIN.frm%20FORM.pdf3.frm

file:///C:/Users/Library%20SIX/Desktop/UserForm8%20tshingmbe.frm

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm8
   Caption         =   "UserForm8"
   ClientHeight    =   7908
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19488
   OleObjectBlob   =   "UserForm8 tshingmbe.frx":0000
   StartUpPosition =   1  'CenterOwner
End
Attribute VB_Name = "UserForm8"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

```
  ClientHeight    =   10020
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19728
   OleObjectBlob   =   "UserForm5tshingombe.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm5"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Private Sub ComboBox1_Change()

End Sub

Private Sub UserForm_Activate()

End Sub

Private Sub UserForm_AddControl(ByVal Control As MSForms.Control)

End Sub

Private Sub UserForm_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean,
ByVal Control As MSForms.Control, ByVal Action As MSForms.fmAction, ByVal
Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal
Effect As MSForms.ReturnEffect, ByVal Shift As Integer)

End Sub

Private Sub UserForm_Click()

End Sub

Private Sub UserForm_Error(ByVal Number As Integer, ByVal Description As
MSForms.ReturnString, ByVal SCode As Long, ByVal Source As String, ByVal
HelpFile As String, ByVal HelpContext As Long, ByVal CancelDisplay As
MSForms.ReturnBoolean)

End Sub

Private Sub UserForm_Initialize()

End Sub

Private Sub UserForm_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal
Shift As Integer)

End Sub

Private Sub UserForm_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)

End Sub
```

```
Private Sub UserForm_MouseDown(ByVal Button As Integer, ByVal Shift As
Integer, ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub UserForm_MouseUp(ByVal Button As Integer, ByVal Shift As Integer,
ByVal X As Single, ByVal Y As Single)

End Sub

Private Sub UserForm_RemoveControl(ByVal Control As MSForms.Control)

End Sub

Private Sub UserForm_Resize()

End Sub

Private Sub UserForm_Terminate()

End Sub
```

INSTALLER FILE PRACTICE ,HARD CORRECT ,LICENCE AGREEMENT,CD DRIVER,

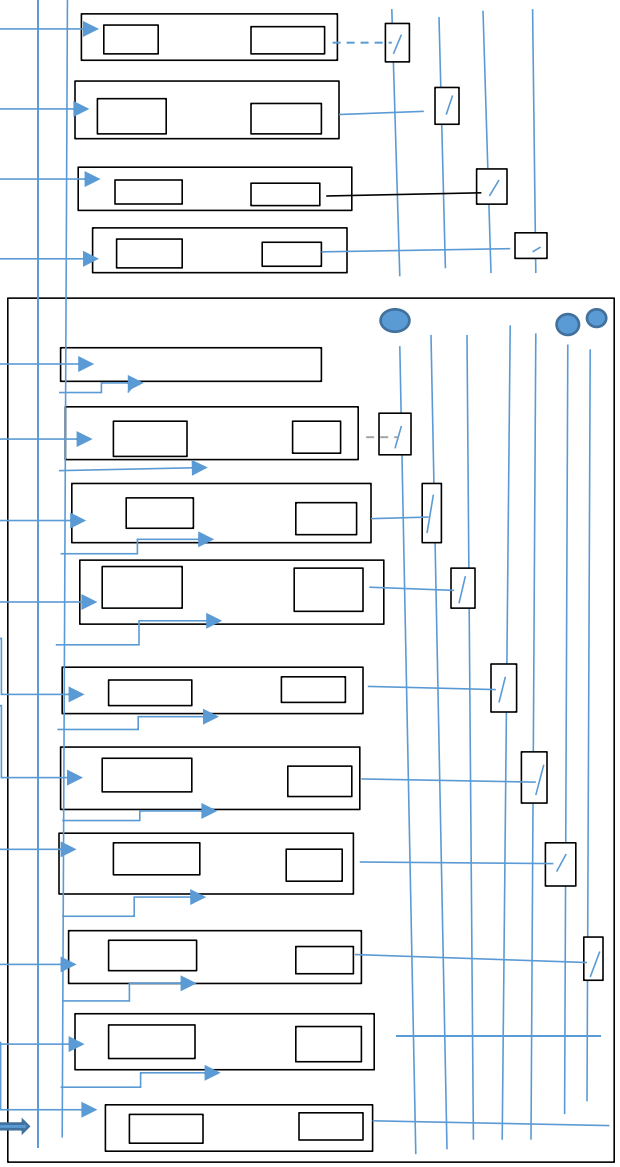
MINIMUM SYSTEM REQUIREMENT

- MS OFFICE WORD
- MS OFFICE EXCEL
- MS OFFIE POWER POINT
- MS OFFICE OUTLOOK
- MS OFFICE ACCESS

- 500 MEGAHERTZ (MHZ) PROCESSOR
- 256 MEGABYTES (MB) RAM
- CD OR DVD DRIVE
- 2 GIGABYTES , AVAILABLE HARD DISK

- MONITOR ,800X600 SCREEN RESOLUTION 1024X768
- KEYBOARD AND MOUSE OR COMPATIBLE POINT DEVICE
- INTERNET AND CONNECTION ,128 KILOBIT ,ONLIN
- WINDOWS VISTA OR LATER
- WORD 2007, HARDWARE SOFTWARE CONNECTION
- ACESS TO PRINTER

INSTALLATION PROGRAMS REQUIUREMENT



Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Colum
CHARGE	CURRENT	QUATITY AH		VOLTAGE	VOLT AMP		WATH	COS	KWH

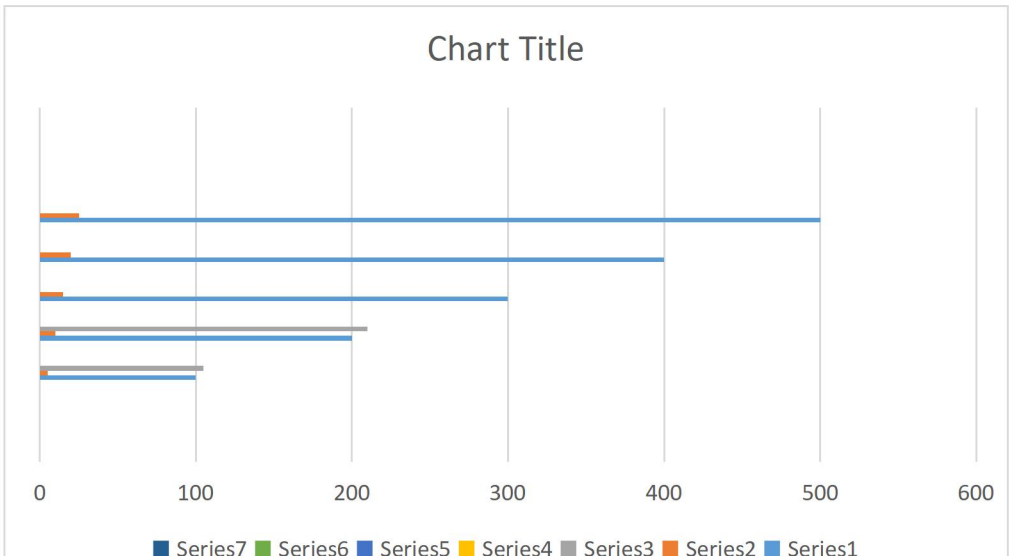
Column1	Column2	Column3	Column4	Column5	Column6
GHZ	BIT GI HERTZ		OCTAL	PIXEL	

MARK

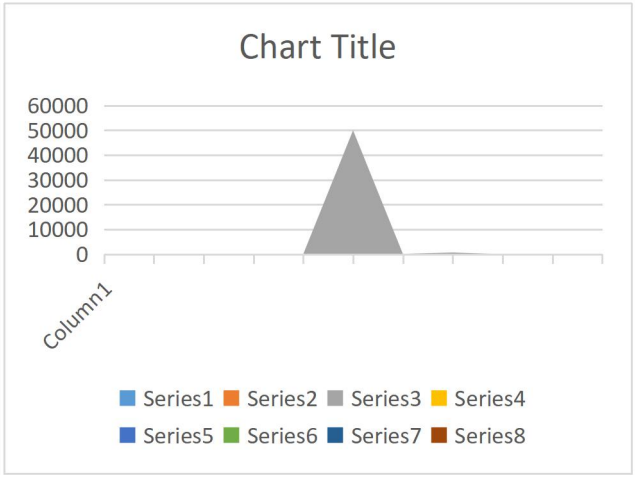
0

Column1	Column2	Column3	Column4	Column5
QUATITY	PRICE EACH	SUBTOTAL	DISCOUNT	TOTAL
100	5	105		
200	10	210		
300	15	)		
400	20	)		
500	25			

#VALUE!

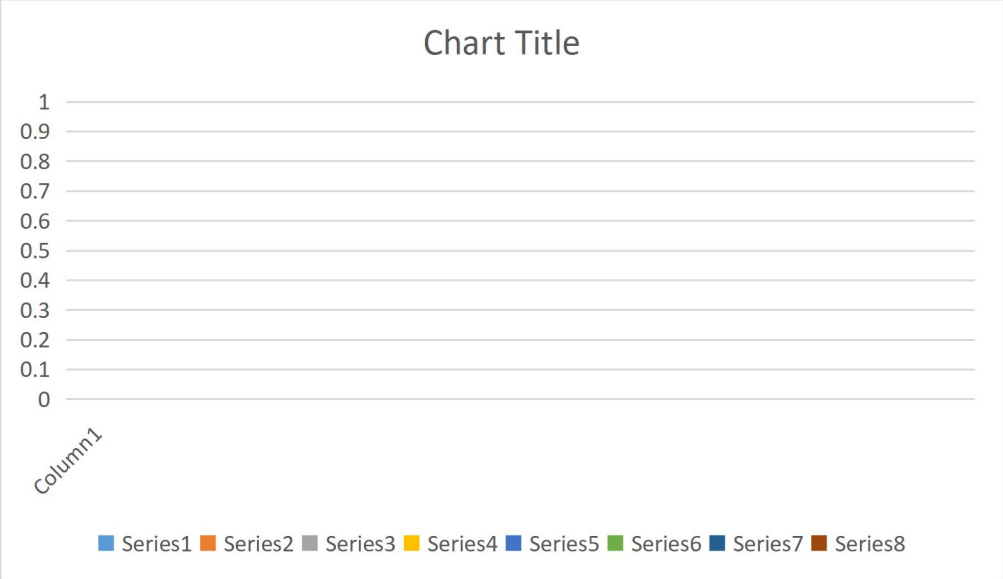


Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
	NAME MANAGER						
	NAME MANAGER		VALUE	REFERS TO	SCOPE	COMMENT	
	INTEREST		10%		WORKBOOK	ANNUAL INTERST RATE	
	LOAN AMOUNT		50000		WORKBOOK	INTIAL AMOUNT	
	MONTH		120		WORKBOOK		
	PAYMENT		660		WORKBOOK		

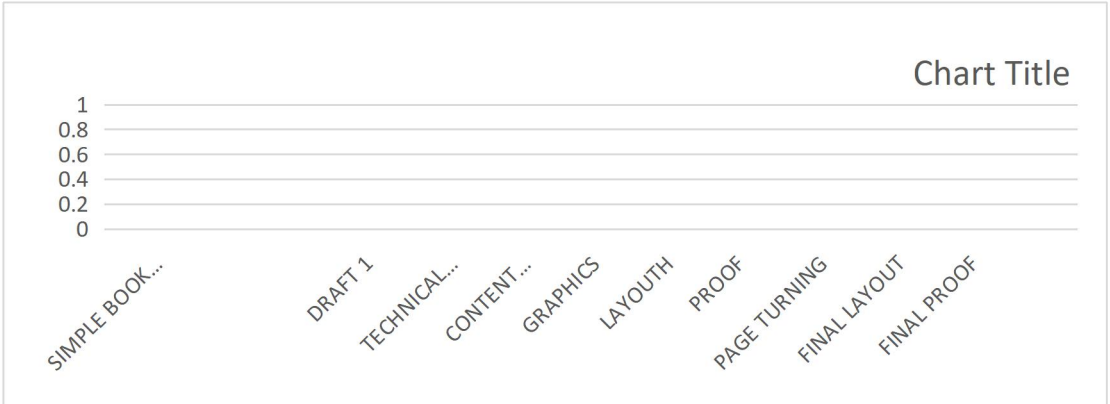


0

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
	OUTLINE DATA						
	DAYS WITH A	DAYS WAS GOOD		MAXIMUN	90 TH PERCENTILE	MEDIAN	
Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8



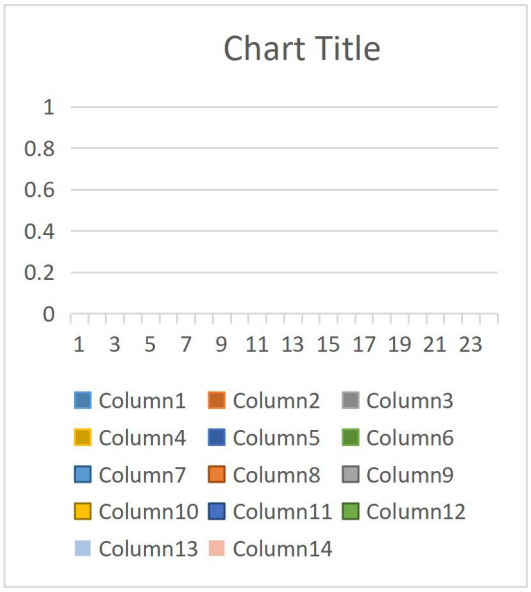
ORDR	CUSTOMER	ORDER	SHIPPED DATA	FREIGTH	SHIP NAME



Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
N71F69A60:N70	WORKSHET REFERENCE						
	SIMPLE BOOK PRODUCT SCHEDULE			DRAFT 1	TECHNICAL REVIEW	CONTENT REVIEW	GRAPHICS
	START DATE						
	WORKIG DAYS BUDGET						
	CHAPTER1						
	CHAPTER1						
	CHAPTER1						
	CHAPTER1						

	CHAPTER1			WORKDAYS	WORK DAYS	0	
				WORKDAYS			
				WORKDAYS			

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
#NAME?	Column2	Column3	Column4	Column5	Column6	Column7	Column8
N71F69A60:N70	WORKSHET REFERENCE						
	SIMPLE BOOK PRODUCT SCHEDULE			DRAFT 1	TECHNICAL REVIEW	CONTENT REVIEW	GRAPHICS
	START DATE						
	WORKIG DAYS						
	BUDGET						
	CHAPTER1						
	CHAPTER1						
	CHAPTER1						
	CHAPTER1						
	CHAPTER1			WORKDAYS	WORK DAYS	0	
				WORKDAYS			
				WORKDAYS			
	TABBLE ANALYSER WIZARD						
	ORIIGINAL PRODUCT						



Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Colu

PRODUCT ID	UNITY PRICE	VALUE OF INVENTORY UNITS STOCK	FIELD
PRODUCT ID			TABL
COUNT	AV	SUM	TOTA
			SORT
			SHOV
			CRITE
			OR

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Colur
FIST NAME		LAST NAME		PHONE NUMBER		CITY		FIELD	
CUSTOMERS		CUSTOMERS		CUSTOMER		CUSTOMERS		TABLE	
								SORT	
ORDER ID		CUSTOMER ID		EMPLOYEER ID		ORDER DATE			
ORDERS		ORDERS		ORDERS		ORDERS			

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Colur
REPORT HEADER CUSTOMES									
CUSTOMERS ID			FIRST NAME		LAST NAME		AD		

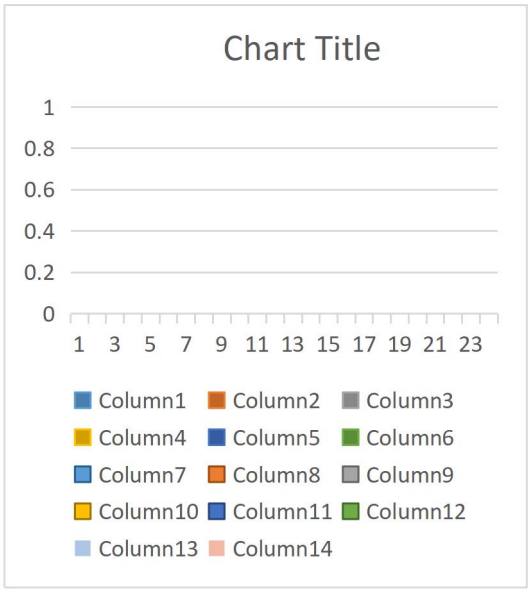


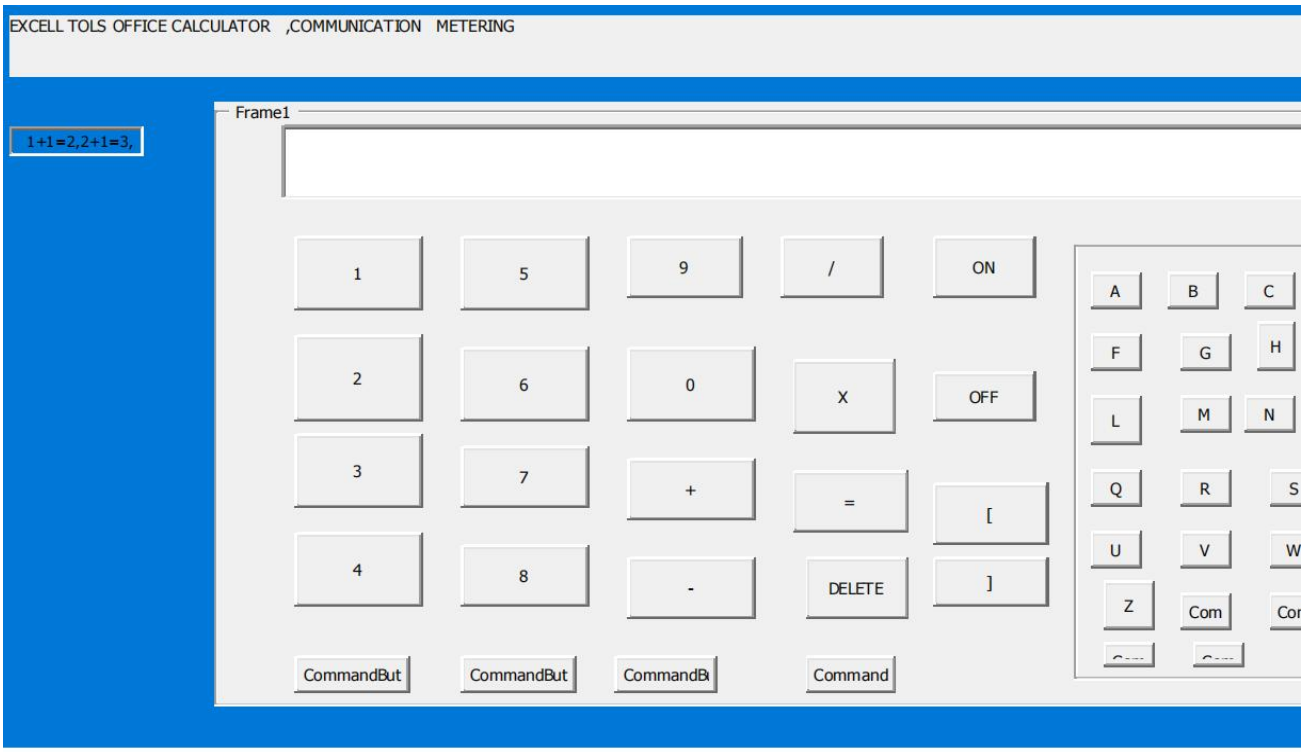
Chart Title
1
0.8
0.6
0.4
0.2
0
1 3 5 7 9 11 13 15 17 19 21 23
Column1 Column2 Column3
Column4 Column5 Column6
Column7 Column8 Column9
Column10 Column11 Column12
Column13 Column14

MACRO RECORD VIEW

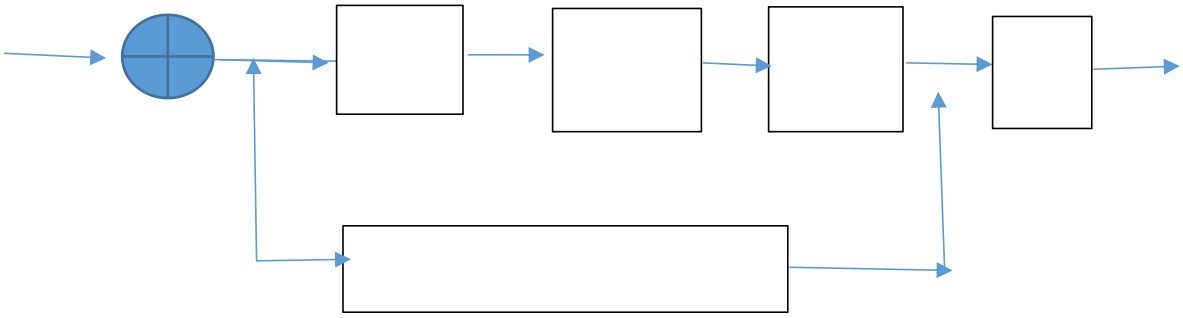
```
UserForm1 - 1
Private Sub Label1_Click()
End Sub
Private Sub Label10_Click()
End Sub
Private Sub Label13_Click()
End Sub
Private Sub Label17_Click()
End Sub
Private Sub Label20_Click()
End Sub
Private Sub Label25_Click()
End Sub
Private Sub Label7_Click()
End Sub
Private Sub Label8_Click()
End Sub
Private Sub TextBox10_Change()
End Sub
Private Sub TextBox12_Change()
End Sub
Private Sub TextBox19_Change()
End Sub
Private Sub TextBox4_Change()
End Sub
Private Sub TextBox6_Change()
End Sub
Private Sub TextBox8_Change()
End Sub
Private Sub TextBox9_Change()
End Sub
Private Sub TextBox9_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox9_DropButtonClick()
End Sub
Private Sub TextBox9_Error(ByVal Number As Integer, ByVal Description As MSForms.ReturnString, ByVal S
Code As Long, ByVal Source As String, ByVal HelpFile As String, ByVal HelpContext As Long, ByVal Cance
lDisplay As MSForms.ReturnBoolean)
End SubUserForm1 - 2
Private Sub TextBox9_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox9_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
```

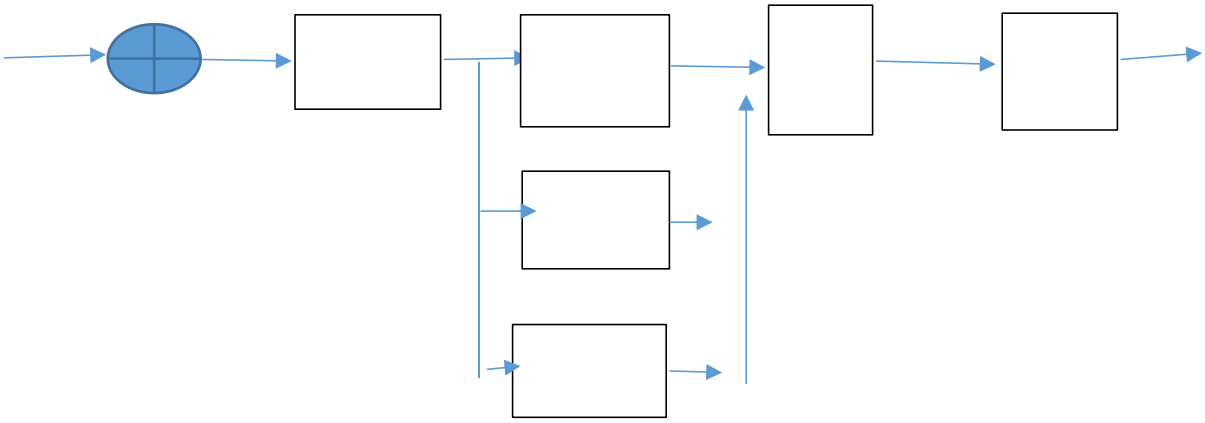
```
End Sub
Private Sub TextBox9_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End SubUserForm2 - 1
Private Sub CommandButton69_Click()
End Sub
Private Sub CommandButton7_Click()
End Sub
Private Sub CommandButton70_Click()
End Sub
Private Sub CommandButton8_Click()
End Sub
Private Sub CommandButton9_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Frame2_Click()
End Sub
Private Sub Frame3_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox2_Change()
End Sub
Private Sub UserForm_Click()
End SubModule1 - 1
Sub Macro1()
'
' Macro1 Macro
' ENGINEER
'
'
Range("I15").Select
Application.Goto Reference:="Macro1"
ActiveWorkbook.Save UserForm2 - 1

Private Sub CommandButton69_Click()
End Sub
Private Sub CommandButton7_Click()
End Sub
Private Sub CommandButton70_Click()
End Sub
Private Sub CommandButton8_Click()
End Sub
Private Sub CommandButton9_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Frame2_Click()
End Sub
Private Sub Frame3_Click()
End Sub
Private Sub Label1_Click()
End Sub
```

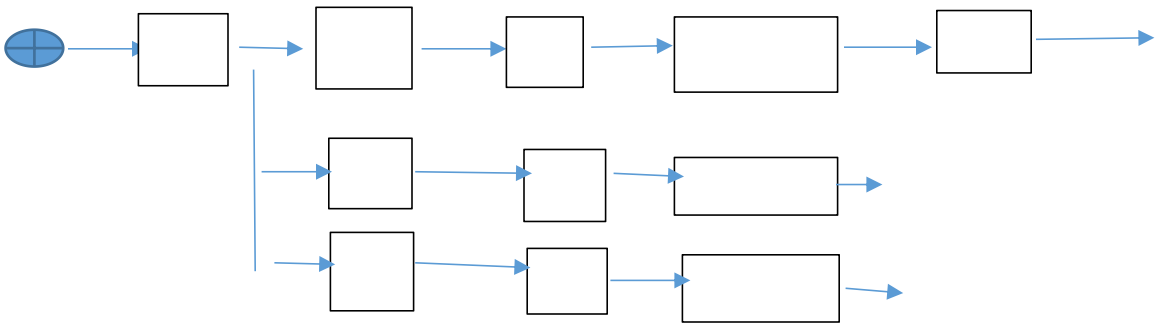
```
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox2_Change()
End Sub
Private Sub UserForm_Click()
End Sub1
2
3
4
5
6
7
8
9
0
+
-
/
X
=
DELETE
ON
OFF
[
]
A
B
C
F
G
H
L
Q
U
M
N
R
S
V
W
Z
Com
Comm
Com
Com
CommandBut
CommandBut
CommandBu
Command
Frame1
EXCELL TOLS OFFICE CALCULATOR ,COMMUNICATION METERING
1+1=2,2+1=3,
End Sub
```




```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm1
   Caption         =   "UserForm1"
   ClientHeight    =   9024
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19812
   OleObjectBlob   =   "EXCELL UserForm1TSHIN.frm FORM.pdf MATERIAL
INSTALLER.pdf 2 CALCULAR HARDWARE.pdf, POWER  ...frx":0000
   StartUpPosition =   3  'Windows Default
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```







=

Experiemental orientation guide workbase Manuel construction guidelines:

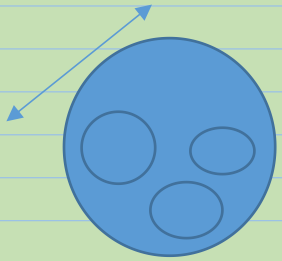
- electrical engineering

Electrician

Design. ,,

Z×A×U= .

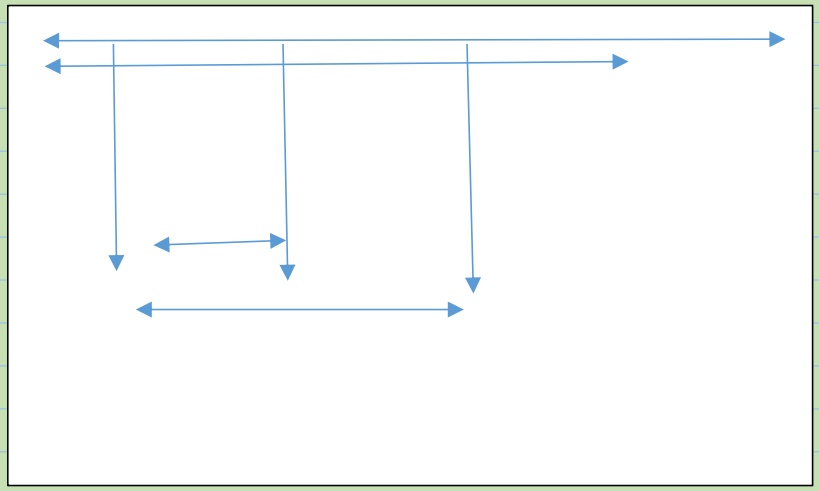
ΔU.2L××Pxz×Z×A



..**schema electrical / drawing design

panel

_____&



Courent I1,I 2..

S= porter in cm ,a = distance in cm ,,

P= U× I.[W].IP.U

P=U×I×cos .flux ..IP × U× cos alph .

P= 3×I×I×cos [W] IP×3×U×cos flux

F2, 0,2×I@×2×s,a

=.....(N)

F3=0,808×F2[N]

F3=0,865×F2[N]

F3=0,865×F2[N]

-resistancd of conductor,L= ligth of conductor ,m aluminy,

- Z = conductivity, m /mm ion ,

A = across area conductor ,mm Sq..

- resistance = of coiling of induction condensator , L = inductance ,H ,f = frequency ,Hz ,,C = capacity ,f v= angle p

- series parallel installation ,

U=I×R[V].I.U..R=, R.I..ohmm × 33 m ,ohm m× 8,3 mm Sq × ohm

XL= 2×π×f×L, XC ,,2× π×f×c

{

=

ZR2(XL-XC)2=+ZR,,cos = --- ohm

RG, R1R2/R1+R2=..

R1R2×R×./ ..

Z..Z.@..Z2..=, X..X..

1.*4.1.2.5*1..Cable and conductor : value short circuit current ,,assignment current ,,

Transformation

- system design of cable conductor:

Cable PVC,0,75 mm , souple,H05V - K ,0,75 black ,,big cable coutchouc ,3 conductor = 2,5 mm ,,

- protection , green yellow , symbol h ,supply voltage ,300/ 300v,03,,$00/500,450/750v

Material insulation cable : caoutchouc naturej styrene ,butadiene silicon material,PVC ,styrene tressfibre

- construction specialist cable : meplat with conductor separe H,NHL ,,cable plastic gain ,cable concentric onduke

- characteristics of materials : polythylene ,elastic ,thermoplastic ,color ,grid degree Up ,stabilt chemit,alcol verni

Fuse motor tree phase value rotor squire ,(DIN VDE 0636,,

Control thermic ,,start delta over load max start ,2 × assignt current , max 5 sec ,, regulation 0,58,,

Switch ,switch gear ,,, close open circuit

Usage current ,

I = courent etablid ,IC = courent coupe,I e = courant assigned d employ ,u tension avant fermeture ,u r = tension motor starting b,,power cut open close ,L/Rv,ms. Break current .

Letter and Laball switch USA ..

S ,switcy combination lock non lokkin, disconnect switch ,drum switch ,flow operated switch ,foot operated swit mushroom head,pressure or vacut,operated switch,pushbuy or vacut, pushbuy swity,pushilluminates ,rotary swi switch ,toggle switch transfer switch ,wobble stick , fuel contactor ,relay blowotbreak coil field ,commutating fiel

Connector,,

- Consol visual ,prodibus , can bopen ethernet commuyaty ,net pin 1, pin

Atex , installation

Command automatics

Installatt port ethernet ,port ethernet prise RJ45,led ,port com

Synopsis cabling system

Logigrame algorithm ,commutator.

_____

1.***4.1.2.6.***Overview : research in training and .university and college ,cpd learning campagnie work base : experiemental.

Module ,construction distribution system design

- describe between fault current peak ,value ,RMS symmetrical value .RMS , asymmetric value ,X/R ratio ,

I= symmetrical RMS current ,IP = peak current,e= 2,71,wv,= 2.p.f ..

Cycle (ANSI/IEEE.C37.13.2.2015..

-Design a distribution system.

-Developm of a system one - line ..imp, --_Standard drawing , additional d

rawing --schedule and specification

- power systems voltage ,

Voltage classified

- income service Volta,income consider

- type of system:

Power system analyse ,short current wave.

- fault current calculat, fault calculai for specifications,medium voltage ,breaker fault ,molded circuit breaker , int

Grounding ground fault ,

- typicK power systt generator and generator system ,generator short circuit ,caractt,generator set size ,rating ,g

- typical applicatt ,health facilities ,quickly generator and load bank ,power quality,

- power quality seism ,ampacities for conductor ,NPA 70-2014,

- safety goal power hazard oashs , NEC

- regulation requ

& Maximum flexibility ,minimum

- maximizing electrical minimy operating : loss conductor transfory .

: discussed further ,

- development phase : input plumbing construction v.

- construcy documents : project ..

- bid .

- project award contractor db panejct.

- single primary feeder loop systeme, primary radial

- duplex fused : switch intelicy..- fused selector switch one .

- soaring transformer substay reijsce ..

System preliminary,factt .

- typical protective relay scheme for small generator , differential reisu .

..
- typical emergency power systems b: ..energy
- maintenance test,
Breakers calculat on a symmetrical current rating : fault calculation : on note interrupted capabilities ,I1,and ,I2,a
- 13,8 kV ,,breakers x/R= 15, 375 MVA,transfo 13,8 kV primary ,3750kva , secondary ,4,16 ,,,50vpc ,w
On system,13,8 kV system ,3,75 MVA base ,
Z=3.75MVA/375,,= 0,01 Pu or 1%
Z^2=X^2+RR^2=R^2(x^2/R^2+1)
R=Z/√x^2/R^2+1=1/√266=1/15.03=0,066%
X=X/R(R)=15(0,0066)=99%
Transformer standard standard ,5,5% impedance has ,+ 75 manufacture toleri,
Transformer standard ,5,5% impedance ..
From transformer loss per unit percent ,R is calcul .
31,000 watts full load
-6,800 watt no load load
_____
24,209 watt load losses
R= 24,2kw/3750 KVA = 0,0065 Pu or ,0,65%
- transform x = √ z^ 2-R^2.√(5.09)^2-(0,65)^2=√25.9 ^2-0,42=√25,48=5,05%
_____

	X.	R.	X/ R
13,8 kV system	0,98%.	0,066%.	15
Transfo.	5,05%.	0,65%.	8
Systt total.	0,04%.	0,76%.	8

.tree

For three phase ,i3 phase = E/x ,,
X ohm ..
I3 phase = IB/X,, IB is base ,,
- base current IB = 3,75MVA/√3(4,16Kv)=0,52k.A
I3 phase = I1/ x = 0,52 /0,0604=8,6k, sym ,,syst ,x/ R= 9 is less 15
Duty circuit ,is 8,6 ka three phase I and moment ..
8,6× 1,6 = 13,7 KA. I 3

- for line - to grounv fault ,
ILG = 3E/2x1+X0=4IB/2x1+xo ,xo is seauet reactance transformer positive ..
ILG= 3(0,52)/2+0,0604)+(0,0505=9,@KA sym ..
The ,50 vcp ,, applied,z= x ,in= x = 0,52/0,55=9,5ka stm ,
X/ R ration ,15 or less multiot ,10 for short circuit bdury ,short circuit duty is then 8,5 kA ,sym ,(I1,I2) and momer

_____

Design distributor system
drawing note / build..

_____

1.*4.1.2.5.*Fault calculation check break application or generator bus for the system generator shoe each generato
pu ,
Gen ,x/R ratio ,30.

1/X's= 1/x+1/x+1/x== 3and 1/Rs= 1/R+;1/R+1/R=3/R..
X's= x/3and Rs ,= Rs=R/3,, system ,X's/Rs = x/R= gen .x/R=39,, generator neutral grounding reactor are used to lir
Amper ,system ,x/R of I multiple b..short circuit duty is 28,4 (29,5 symetricaj ..
-Three phase symmetrical interri capacity

_____

Breaker type|vmax| max ki| at 4,16 op vo

1.*4.1.2.7.*Overview: trade theory base experiemental.
-basic electricity ,: continuing education professional development course ,
- technical learning college..
Training ,basic electricity course energy and system electricity , system fundamental math. ..
- electricity
-1. introduction: ,energy foundation ,joules ,
How to generated ,electrical transmission.
-2. simple forms of electricity : static electricity , magnetic and electricity , electromagnetic,electric charge :
-3.electrical princiy introduction : electric power distribution ,electronic introduction,electrical principle ,circuit ,
4.hydraulic analogy principle : hydraulic component equivalent hydraulic equation
Limited to hydraulic analogy .

- electrical low and theory :tangent ,gal ometer , understanding ,Faraday low ,maxset Faraday ,electrical generat
- classical mechanics , potential difference ,power resistance and current ,power ..
- circuit : coils and capacitor : parralke ,parallel ,resistance ,
- power phases : understanding single ,understand three phase ,phase converted ,AC power generay ,sine :
- transformser : transfo efficiency trisgke delta ,polyphase ,3 phase edisub system connecting load single three p

Electrical motor : motor lubrication, electrical motor introduction ,brushes, AC motor breakers ,motor problem c

_____

Energy introduction : electricity principle charge act ,,

- an electric field a complex simple type electromagnetic field by and electric ,.
- the electrician ,generator devi

- type of transfo,air core for use ,above ,1mhz ,iron core use 100 khz - 1mhz,,iron core for use at audio main freq

up ,, ..primarie in series's for ,239 volt , kub primary in parallel,main isolating transformer ,building site transfo pl

Wye introduction:

I1= v1/|Ztotal|<(- Teta)

I2=v2/|Ztotal <(-120-teta)

I3=V3/|ztoak|<(129°-0)

Z totaj total = zln + zy ,,z toaj ,,

I1+I2+I3=In=0

Delta = V12= V1-V2=(vln<0°)-(VLN<-120°)

=√3VLN<30°=π3v1<(phase v1+30°)

V23= v2-v3=(vln<-120°)-(vln<120°)

= √3VLN<-90°=√3v2<(phase v2+39°)

V3.1= v3-v@=(vln<120°)-(vln <0°)

= √ 3vln <150°=√3v3<(phasev3+30°)

.I12=V12/|ZΔ|<(30°-teta)

.I23=v23/|zΔ|<(-90°-teta)

I31=V31/|ZΔ|<(150°-teta)..

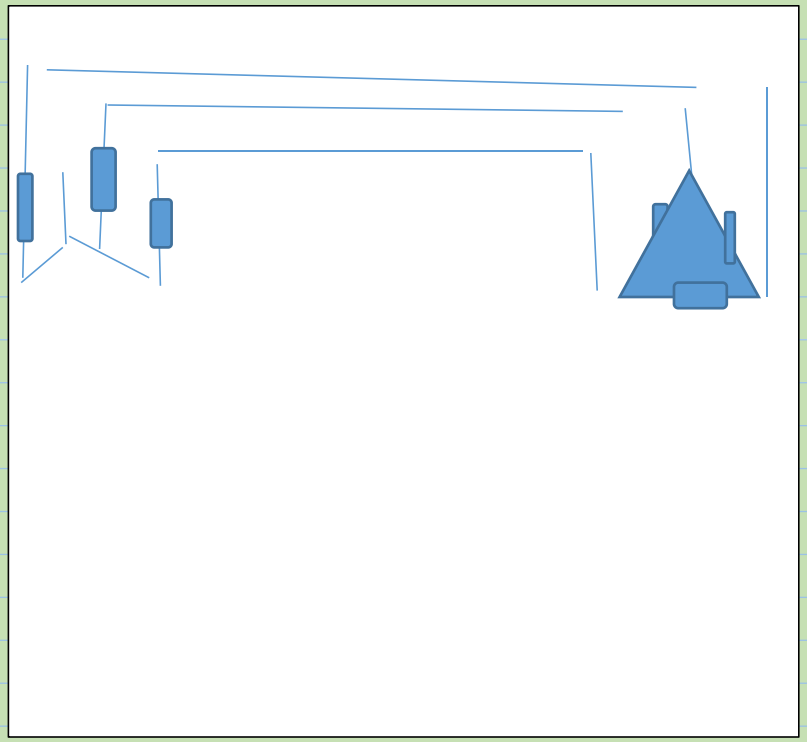
Relate ,si I31.

Kck ,node..

I1=I12-I31=I12-I12<120°

=√3.I 12 <(phase ,2 - 30°)= √3I13(-teta)

- I 2 = √ 3.I 23 < (phase i23-39°)=√3.I.23<(-129°-teta)



I3= √3.I 3 < (phase i31-30°)=√3.I31<(120°-teta) ..

_____

Connecting transfo

-vo= vt× np, ,,/ VT ,VT ,,vs = VT × NS.

N..

Vs/ vl = Ts/To =

Vs= vp× secondary turns/primary turns..

_____

-maxwell Faraday equation: z vector ,x vector ,y vector ,, n ,sum ,,integral differential sum..

- Maxwell Faraday equation ,-v×E= -derive partial .B/ derive partial times.

- v- the curl operator ,E(r,t) is electrical field ,and B (r,t) magnt field generally ,r and time ,t

- Maxwell Faraday ,four equation fundamental theory classic electromagnetic ,integral for ,Kelvin Stokes theorer

Integral countiurn .E× DL= - integration .sum to ..derive partial B./derive partial time × dA..

Sum is a surface bounded by the closed contour ,sum derive partial ,,

- E is electric field ,B is the magnett field ,

- dk is an infinitesimal vector element of the cotyr ,derive partial ,sum .

- dA is an infinesimal vector element of surface ,sum if it's direction is othogky to the surface patch magnitude is

* Hydraulic equation example.

- hydraulic.

Type	hydraulic	electric	thermal	mec
Qty	v/m cubs	q(c).	. Heat Q,j	p,s
Pot	P[Pay=j/m	V=j/c	k=j	v ,m/ s
Flus	m^3/s	A= C/s	A.j/s	force ,F.
Flux	v/ m	C/ m.s = A/ m	Q" ,W/ m	
Lin.	π.r.Δp/8.n.l	j=- - .	Q" = k.vt..	

Linea model ,poseilk low ,ohm ,,

_____

Understanding voltage introduction:

Δ vba= vb-va= - integral (b) to (do) E vect× DL .vect -(- integral .A to do ,E.dl ..

= Integrally .B to ri ..E .DL + integral.a to ri .

Vec E.dl = integral .A to B .E .vect .DL vect

2.1.38,, 2. Projec13. * Winding on rewinding transformers and machines both DC and AC involves understanding the

13.1.* Understanding the types of machines .* DC machines these include DC motor and generator which typically h

- AC machine : these include ,AC motor ,like induction synchronous motor and transformser .

-2 key parameters for windings.

a winfmding specifications;

1. Number of turns (N) the number of turns in the winding affect the voltage and current characteristics.

2. Wire gauge : the thickness of the wire affect the resistance and current carrying capacity.

3.* Winding configuration Serie parallels combination depending machine type calculating wing parameters.

* For DC machine .

1.calculate the number turns the number of turns can be calculated based on the desired magnetic field strength fo

-_____

- to calculate aspect related to telephonic cellular telecommunication supply .

- understanding cellular telecommunication supplies cellular telecommunication supply involves the infrastructure a

* Base station : equipment that connect mobile devices to the network's.

* Backhaul the connection between base station and the core networks.

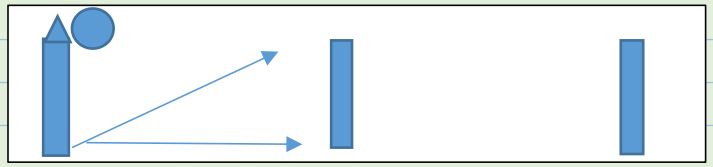
* Core network the central par of the telecommunication network that manage data and voice traffic

,##2* key calculation.

a* coverage area calculation the coverage ,area of cellular tower can estimate using the following ,\[A=\PIr^2\]

-\(A\)=coverage area (in square kilometres)

-\(r)=radius of coverage (in kilometres)



Example : if a tower has a coverage radius of ,5 km

\[A=\pi(5^2)\ approx ,,78.54\ text { km } ^2\].

b. Capacity calculation: the capacity of cellular network calculated based on the number of channels available ,traffic

_____

* To calculate the component of a cellular telephone system and derive relevant integral, .

1. Components of a cellular telephone system ,

A: cellular telephone system typicay consist of the components.

* Mobile station (ms) * the users device ,smart phone tower that communication with mobile stations.

* Mobile switching centre ,MSC , manages the communication base station and the core networks .

* Core network,handles data routing billing and other ,

,2 calculating key metrics.

a.coverage ,Area calculation the coverage area of a base station be estimated using .

\[A=\pir^2\]

-where .\(A\)= coverage area in square kilometres .

.\(r\)= radius of coverage in kilometres ,ex : if a base station has a coverage radius of ,3 km .

\ [A=\ pi (3^2)\ approx ,28.27\,\text ,{km} ^2\]

.b capacity calculation.

_____

To calculate the spatial transmission characteristics of a system particularly in telecommunication.

##/ understanding spatial: transmission, spatial transmission refer to how signal private ,space transmission refer to

* Free space path loss (fspl) the loss of signal strength ast travel through free space.

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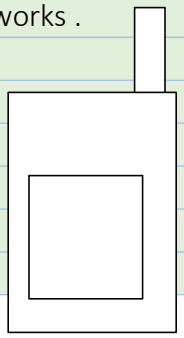

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* Free space path loss (fspl) the loss of signal strength ast travel through free space.

* Multiple path propagation the phenomenon where sign effect : the change in frequency of wave in relation to

2 calculating free space path loss (fspl) the free space path loss can be calculated using .

\ [text \ text { fspl } = 20\ log - { ,10}{d} 20 log { 10}(f)+32,44\] where : \ d = distance between the transmit and re
distance ,\ d (d) is ,10 Kim and the frequency, (f\) is ,900MHz ,\[\ text ,{ fspl}

To calculate the properties of material used and conductor insulator and magnetic material in electrical and ster

1. Conductor : are material resistance common conductor..

- resistivity calculation the resistivity,

(\(\ rho}) of conductor is a measure of now strongly it resist the flow of electric current the resistance ,

(\(R)) Of conductor can ,

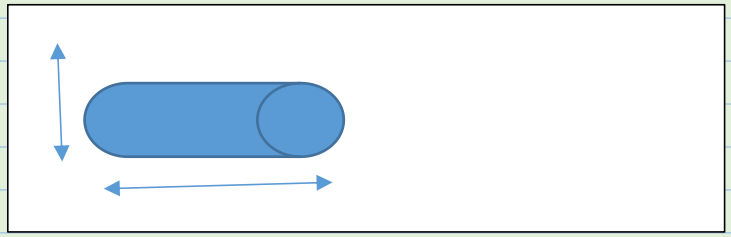
}[R=\ rho \ frac { L}{A}\]

.\(R\)= resistance,(ohms) .

.(\rho)= Resistivity (ohm metre)

.(Li)= Length of the conductors meter

./ (A\)= Cross - sectional area ,saaremeter .



Ex . Calculation for copper wire with a length of ,2 meter and a cross ,section area of \+|\ mm^2\)

(Which is / (i\ times ,10 ^{ - 6} , m ^\)) And using the resistivity of copper (\+\ rho \ approx ., 1,67\ times . 10^ ,=

R= 1.68 } times , 10^

To calculate the size of a winding for stepper motor .

1. Understanding stepper motors.

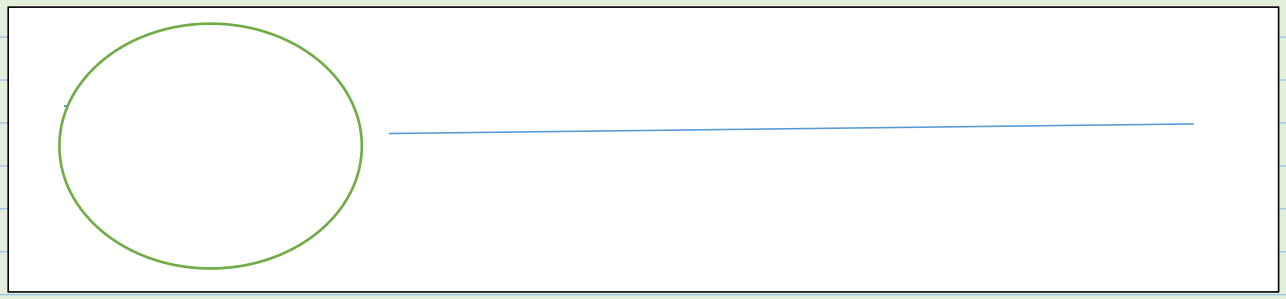
- a stepper motor is a types of DC motor that decides a full rotation into a number of equal step winding configu

* Number of phase : most stepper motor are either ,2 phase ,5 phase..

* Number of steps per revolution ,common value are ,200 steps ,(1.8 degree per step or ,400 steps (0.9 degree

* Windt configuration the arrangement winding unipolar wire gauge : the thickness of wire used for the winding

3. Calculating the size of the winding : determine the number of turns s , the number of turns in each winding ,ca



-<u>14. measure in true.</u>

*1 types of measure errors measure : systematic these are considering repeatabt errors that occurred measurer

*Random error unpredictable and can vary from one measure.

- gross errors : the are large errors that occure to human .

* Calibration of instruments ,calibrat is the process of adjusting instrument to ensure its measure are accurate st

1. Select a standard: use a reference standard.

2. Measure with the instrument take measures using the instrument.

3. Compare measurements , compare the instruments .

4. Calculate errors the errors can \[text { text error }= text { measured values \ text { true value } \]

5. Adjust the instrument if system error are found adjust .

- to perform conversion between binary hexadecimal.

Conversion between number systeme.

* To convert a binary number to decimal ,use the formuler , \ [\ text { Decima} = sun -{ I= 0}^{n}b-1\colot 2^i/] ,w
at 0 convert ,\ (1011_21) to decimal \ [= 1\ colot ,2^) to decimal \[= 1\ colot ,2^3+0\ colotv,2^2+1\ CDOT,
2^1+1\ colot ,2^O= 8+0+2+1=11_{10}\]

-decimal to binary : to convert a decimal number to binary divide the number by ,2 and record the remainder , re

Exp : convert \ (1@-{10}\) to binary .

\ [11\div ,2=5\ qual\ text { remainder ,r= \\ ,5 \ div ,2=2\

-to calculate the size of a memory accumulator in a binary system.

1) understanding binary representation:

In a binary system ,data is represented using bits ,binary digital where bit can either 00r,1 the number determin

2. Memory size calculation : the size a memory accumulator based number of bit it the total number of unique re

\ [text { number of values } = 2^n\]

Where . \(n\)= numbers of bits.

* Example calculation: determine the size of the accumulation.

2) calculate the number of value ,\[\ text { number of values }= 2^ 8 = 256\]

This mean the accumulator can hold values from \ (01) to (255\)(decimal ,### memory size in bytes * memory s

_____

To calculate thevenin , equivalent of a network ,short circuit current and voltage value ,

1. Thevenin theorem.

* Overview: thevenin theorem state that any linear Electrical net with voltage source and resistance can be repl
single resistor (\ (R-{ the}\)).

2. Step to find the in equivalent.

a identify the portion of the circuit select the portion the circuit for which

b calculate thevening voltage (\(V - (the }\))

1.open - circuit voltage, calculate the voltage across the terminal where the load was connected this is the theve

-2 method : you voltage division nodal analysing

- calculate thevenin resistance (\(R-{the}\))

- deactivated all independent source : replace independent field.

- to calculate amplification in circuits involving diodes transmission diode transistor ,and triacs understand each a

diode amplification diode are typically not used for amplification in the Sens performance signal modulation re

\[I-D= L.S \ left (e^{\ frac { V-D}{ NV - T}} -1 rigth .

. \(1-D\)= diode current (A).

.\(I-S\)= reverse saturation current.

. \(V-D\)= voltage across the diode ,V

.\(n\) = ideality factor (typical between ,1 and ,2

. \ (V-T\)= thermal voltage (\approx 26\ MV) at room .

2. Transistor application transistor can use common collector thermostat common ,is common emitter amplifier

1. Voltage gain (\ (A-C\))\[A-V=

_____

To analyse and calculate parameter in a control system we typically focus on aspect such systems stability respor

_____ '''''''

2. Basic concepts in controle systeme.

* Open - loop control system : systeme that does not use feedback to determine if it's output has achieved the d

* Closed loop control system systeme that uses feedback to compare the actual output to the desired output.

,2 transfer function

The transfer function.

The transfer function \(H(S)\) of a control system relates the output (V(s)\<) to the input *\ (x,(s)\) in the Laplac

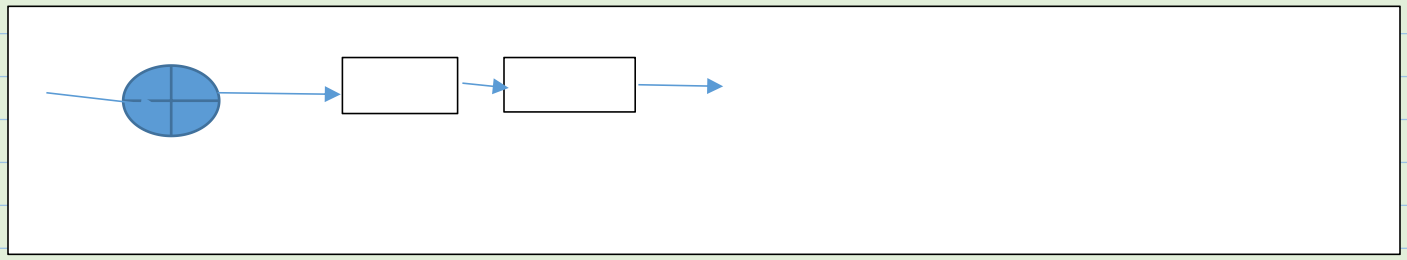
3. Stability analysis , to determine the stability of a control system we can use the characteristics equation deriva the transfer function to zero

- for a transfer functions , ,\[H(S)=\ frac {k}{S^2+3S+2}\]

The characteristics equation is .

\[S^2+3s+2=0\] to find the root we can use ,

S=\ frac {-b\ pm \ start ,{ b^ 2-4ac}}{2a}



1. DC machines : speed (n) the speed of DC motor can be calculated using formula \[N=\ frac { V-1\ CDOT -R}{ C

- where \ (N\ ) = speed in Rpm (revolution perminute .

- \ (N\)= supply voltage (v) ,

-\(i\)= armature current (A)

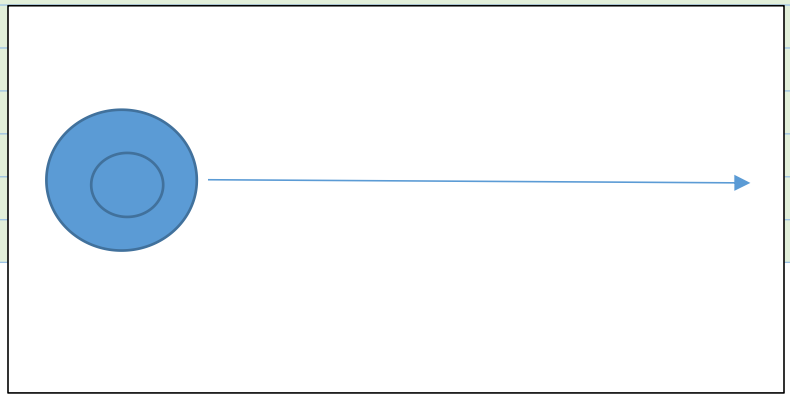
\ (R\)= armature resistance ,(ohm .

\(K\)= a constant that depends on .

.\(\ Phi\) = flux per pole ,(WB)

b ,torque ,(T) ,the torque procedure by DC .

T= k \ CDOT } phi \ CDOT \] ,



Where .

.\(T\)= torque ,(N.m)

\(k\)= A constant that depends .

\(phi\)= flux per pole WB .

\(|\)= armature current .

_____

To calculate de gradient of a function and derive the integral of a Senegal,

1. Calculating the gradient of a function

The gradient of a function \(f(x,y)\) is a vector that contains all of its partial derivatives for a functionalite of two

\[\ nabka , f=\ ,left(\fract { \ partial f) {\ partial x } , \ frac \ partial f }\ partial y \ right.

f(x,y) = x^2+x^2\]

.step ,1 calculate the partial derivatives.

.\(\ frac {\ partial f}{ \ partial x }=2x \)

.\(\ frac {\ partial f }{\ partial y}= 2y , I)

. Step 2: write the gradient \[\nabla ,f =2x,2y)\]

2. Deriving the integral of a signal ,we typically,use the fundamental theorem of calculus ,if we have a continuc

Is given by : \[\ into$a^ b f(f) \,dt\]

-___

To calculate derivation ,both partial total double ,triple, relate ,to signal detection.

1. Partial derivatives : partial derivatives are used dealing with functionalite of multiple variable , for a functional

\(f(x,y)\) the partial derivatives with respect to \(x\)

Is denoted as \(\ frac{\ partial f }{ partial x}\) and with ,

Respect to \ (y\) as \(\ frac {\ partial f }{\ partial ,y }\)

Examp : \[funct \[f(x,y)=x^2y+3xy^3\]

* Calculate partial derivatives .\(\ frac \ partial f){ partial ,x }= 2xy+3y^2\)

.\(\ fract \ partial ,f }{ partial y }{= x^2+6x6xy\)

* Total derivatives : the total derivatives account how a functionalite change with respect to all it variable.for a fu

\(f(x,y)\), the total derivatives \ (DF \) is given by : \[DF = \ frac { \ partial f }{\ partial x }sx +\ frac{ \ partial }{ \ pa

Using the previous : \ [DF = 2xy+ 2y^2)

_____

- to calculate the Laplace and Fourier series Fourier a random vibrational signal ,signal aleatoire vibratoire in the

1. Fourier series : the Fourier series and cosine function for periodic function \ (ft)\) with period (t) the Fourier s

f(t)= a 0+\ sum ${n= 1}{\ infty}

\ left + a_ n \ cos \ left \ left + } frac { 2\ pi not }{T}

\ right) + b _ n \ sunleft (\ track { 2\2 Pu ,not { T}\, \ rigth \ rigth)\]

- pratical exercise related to electrical engineering

Exercises calculate the total resistance in a circuit problem statement have ,3 resistance.

Resistor ,R1= 100 ohm resistor ,R2= 20 ohm , resistor ,R3= 309 ohm

Formula for total resistance.

.\[R-{\ text t{ total }}= R1+R2+R3\]

. Substituting the values \[R - { \ text { total }}= 10\.\ text , { ohms }+ 20\, text{ ohms}+30\, text {ohms}\], calculat

---

- to calculate the supply trade theoty impedance and resonance in a electrical circuit ,we typically deal with RLC ,

1. Impedance ,Z in a RLC circuit the total impedance is combination of resistance ,(R) inductive reactance ,x l an

[Z =\ sqrt{R^ 2+(x-L-X_C)^2}\]

Where _\(x_L= 2\ pi f L \ Pi .f.c\} (capacitive reactance ,

-\(X_C)=\ frac ,{1}{2\ pi.f.c}\}(capacitive reactance.

-|(fI) is the frequency in Hertz (z)

-\(L/) is the inductance in Hertz (Hz) ,

| (L /) Is the inductance in Henry(h)

-\(cl) is the capacitance in farad (f)

2* resonance occurred in an RLC circuit when the inductive reactance equals the capacitive reactance (\ (X_L= resonance frequency form resonance frequency (\ (f - I)) is \

To the calculate the fundamental system electric power factor we need to understand relationship between rea

1 .real power ,P owner reactive power and apparent power in electrical how to to definition real power the actu

2) reactive power ,q the power the oscillator between the source and the load measured in volt amperage reacti

3 ,apparent power ,s the total power in the circuit , measure volt ampere ,Va is the combination a real and react

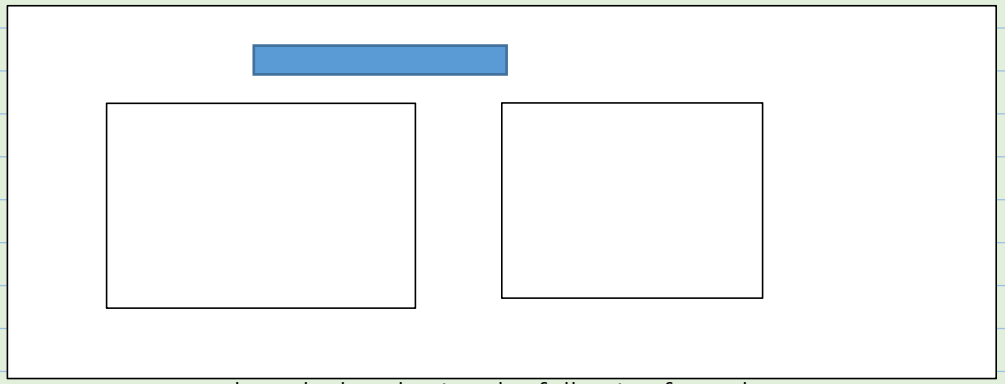
- power factor calculation:

The power factor ,of is defined as the ratio of real power to apparent power , \ [\ text power factor ,of)}=\ frac ,

Where : .\(P\)= real power (w)

.\(S\\)= apparent power ,(VA)

apparent power calculation



apparent power calculay the apprent power can be calculated using the following formula .

\[S=\sqt{P^2+Q^2}\]

.value .real power (\(P\))=500w,

.reactive power(\Q\))=300VAR

- calculate apparent power (s)\[,S=\sqt{P^2t

- to calculate the characteristics of AC and DC machine we typically look at paramt such a peed torque and electr

Characteristics for both type machines .

-where .

|(a-O=| frac {1}{T} int- 0^ f(t)\dt)

.\+a-n = frac {2}{T} int_O^Y f (t) \ cos\ left (\ frac { 2\ Pi .n t}{ t } rigth \, DT have simple square wave function.

_____

- to calculate the transformation and conservation of signal in the context of electrical signal we.

1 .signal transformation Fourier transform.

- the Fourier transform is used to convert a time domain signal into it frequency domain represent formula : tran
- where . \(f+ \ omega)\) = Fourier transform of the signal.

.\(f(t)\= time - domain signal .

.\ (\ omega \) = angular frequency in Radia per second ..\ (j\) = imaginary unit .

BB* Laplace transform

- the la place trans is another transformation used to analyse linear time _ invariant system formula for the la pla
- \(f(s)\)= Laplace transform of the signal .
- \ f(ft c)I)= time domain signal.

_____

- to calculate and understand synchroun and synchronous system, particularly in context of linearization .

1. Synchronous systems.

- in a coordinated, governed a common clock signal , in electrical synchronise system are used in digital circuit ar
- example : lineare system the state space representatation .

\|[| dot { x}(t}=Ax(t)+By(t)\]\[y(t)=(x(t)+du(t)\]

Where :

-|(x(t)\)= state vector

.|(u(t)\)= Input vector

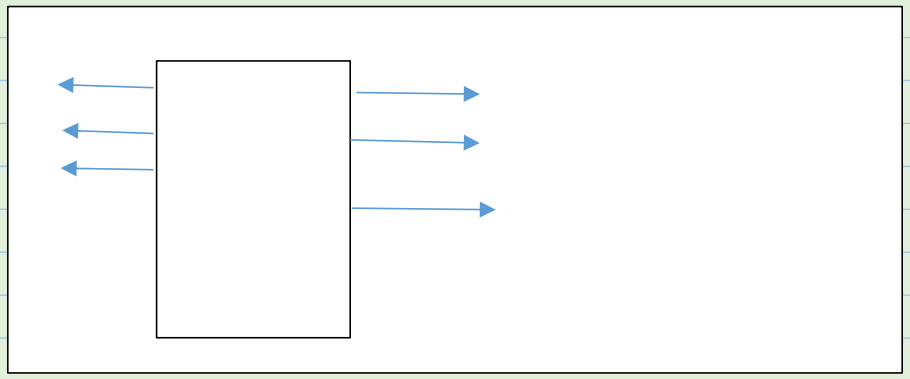
.\ (y(t) \)= output vector .

.(A\)= System .

.\(B\)= input matrix .

.|(C\) = Output matrix .

.\(D \ ) = feed forward.



_____

2.asynchronous system as asynchronous system operate without a global click signal operate independently and system .

- example equation for an asynchronous ,for an asynchronous linear systems the state space representatation .

|[| Dot { x} (t}= Ax (t) + B(t) \ ]\[y(t).

_____&

To calculate the integral of an amplified signal , detection of a signal and the probability of a radon signal aleatoi

Integral of plidie signal

If you have a signal \ f(t)\) that is amplified by a constant factor \(A\) the amplifier signal can ,be represented as A\ into _ a^ b ,f (t) \ St

Exampt say \ f(t) = t ^ 2\) and \(A= 2\) we want to calculate the integral from \ (0\) to \ (1 }):

\[\ into _0^/2t^\, St = 2\ in_ 0^ t^2\,dt\]

Calculating the integral

\[into 0^1t 2^2\,St=\ left[\ fract { t^3}{3}\ rigth]-0^1=\

Frac {1^3}{3}_\ frac { 0^ 3}{3}=\ frac { 1}{3}\}

Thus \[\ into _ 0^ 1 ,2 T ^ 2\,dr..

_____

To calculate or design a program for artificial intelligence ,AL within an operational framework we can outline th

Program

- 1 define the operational framework : an operational framework for an all program typically includes the followi

* Objective : clearly defined the purpose of the Al program classification predict optimisation

* Data source : identify the data source requirements for training and testing the Al model database ,APU real ti

* Algorithm : choose the appropriate Al algorithm based on the problem type ,supervised learning , unsupervise

1. Data collection and preprot

Data collection gather data from identified source this could involve wab departing using APIs or accessing datab

* Data cleaning : remove duplicate handle missing value and correct inconsistent in the data.

* Feature ent : select and transfy relevant feat that will be used in the modej .

3* model development.

* Select model choose the AI model based on the problem type for .

- for classification decision tree random ,forest ,support vector ,machine ,neural networks.

-* for regression linear regression polynomial regression neural networks .

- training train model using the data set .

- to calculate a physical chemical plant balance we typically use the principles of mass and energy balance this,in
approach to performing a mass balance physical chemical process .

2 define system : identify the boundaries of the system your are analizing this could be reactor distillation colum

3. Identify input and output : list all the input and output system ,input can include raw material solve energy sou

-

14*. Mass balance equation : the general mass balance equation can expressed as :

\[\ text { input }-\ text { output }+\ { generation } \ text consumption}=\ text { accumulation \ ]

- for a steady state process (where accumulation is zero the equation simplified to \[\ text { input}\ text { output

4.example calculation consider a simple chemical reactions input : A= 100kg / h , B =50 kg /h ,output ,,C= 120kg /

.product..

_____

14.1 to calculate the derivative and integral related an electromechanical systems we typically analysis the syste
approach to derive the master equation and performance the necessary.

14.1. master derivatives : electrical derivatives for a simple electrical circuit with an induction ,\(L\) and a resisto

Where \(v-L)= voltage accross the inductor.

.\(|\){ current through the inductor .

- b mechanical derivatives:for a mechanical system the relationship between torque \ (\tau\) and angular velocit

\ you = |/ frac { d\ omega }{ St}\]

- where .\ (\ tau\) = torque.

\ (\\)= moment of inertia

\(\ omega \ ) = angular velocity master

_____

14.2 definition: isostatic system a system that hasjus enough support to maintain equilibrium without any redun

- hyperstatic for equilibrium leading to redundancy in constraint.

* Stability : refers to the ability of a system to return to its original state after disturbance.

* Stability analysis: for stability analysis ,we typically use method.

Eingenvalue analysis for a system represented by a matrix the eingenvalue can indicate stability ,if all aigenvalue and ,,\(\dot{(V)(X)<O\) for stability.

14.4 transformation to linear system to transform a hyperstatic system into a linear system , we can use the follo

_____

14.6 creating a programme for a artificial intelligence ,AI , system that focuses on operational metering in electri implementation . Algor designed the architecture implementation algoris below .

- 1 define objective

- purpose : the AI system should monitoring analyse and Optimizer electric metering operations.

14.7.

Key features:.

- real time data collection from electric meter .

- data analysis for consumption patterns.

- anomaly detection for identifying irregularity.

- predictive maintenance for meter reporting and visualisation of data.

_____

14.8. system architecture:.data source electric meter and sensor ,Day ,SQL no sQL) to store historical data .

* Processing layer , implement data processing and analysis using AI algorithm.

* User interface development a dashboard for user to visualisation data and insights.

* Data collection / use API ,,direct connection to gather data from electric meters,example shifter for data collec

* Python,import request,def ,collect meter dentK meter data storage.

- r esponse request get ,(f" http:// API electricity meter comparable ,/ { meter _ I'd "} return response .jsob ( )

_____

14.9.Creating on expert system for network involved several steps . < Including defining the objective designed t

-* define objective :

Purpose .the expert system shouand ld assist in network management troubleshooting and optimisation.

* Key features: network monitoring and performance analysis troubleshooting and diagnostic capabilities.

- recommendations for network configuration.

User friendly interface for networking administratir.

2. System architecture , knowledge base a repository of network knowledge including rules ,fact and heir interfe

- implementation step : knowledge base developm.protocols configuration common issues and solutions
-plain text .
If network _speed < threshold
Then
If packet _ loss >
Acceptable _ level then
Recommended _ check _ hardware.
- inference Engine implement the inference Engine to process user queries and apply the rules from from the kr
Ex code snippet , python.
Python
Class expert system
Def _ initi_ self
Self . knowledge base
- to analyse a pneumatic hydraulic vibratory system equation governing the system and performance integrals
1. Understanding the system ,A pneumatic - hydraulic
Vibrator system typically consist of
* Pneumatic components : air driven actuator or cylinder.
* Hydraulic components : fluid driven actuator or cycle

to
16.hydraulic components:fluid driver actuator or cylinder .
* Vibratory mechanism , A system that produces oscillator or vibration, oft used in applications like material.
2 . deriving equation for a pneumatic hydraulic system the dynamic described using Newton second low and the
_1 force balance the net force acting on the system,express as \F-{\text { net }}=F-{\ text { pneumatic}}++ ,
F-{\text { hydraulic }}- , F {\ text { damping }}-F{\ text (inertial }}
2.* Pneumatic force .the force generated by a pneumatic actuator.
_____
To derive the relationship force ,motion. ,power ,energy .
\[F= m\ CDOT a \ ] where.
.\(F\) = force (N) , | \ (m \)= mass (kg) |\(a)= acceleration ,(m/s.s)
* Work done by a force : work (\(w\) is defined as the force applied to an object time distance (\(d\) over which
Is applied in the direction force .
|[W= F \ CDOT d \ CDOT \ cos(\thita \]
.\(w\)= work ,joule

.\(f\)= force ,N

.(d\)= Distance,m

.\(\ theta \ ) = angle between .

,3 energy :

Kinetic energy ,(k.E) is the energy of an object du it's motion .

\[K.E= \frac {I}{2}.m.V^2\..

Where .

\(V\)= velocity (m/s)..to analizing the concept of magnetic electromagnet and electrodynamics,system in relatio

_____

- understanding the concept.

- solenoid ,a coil of wire generate a magnetic field an electrical current pass through it.

* Magnetic moment ,A measure of the strength and director of a magnetic source

* Electromagnetic induction , a measure of the strength and direction of a magnetic source .

* Electromagnetic.iduction .the process by changing magnetic.field induce and electromotive force ,EMF ,in a co

* Electocinectic ; refer to the motion of charged | particle a fluid under the inference of an electric field magnet

-the magnetic moment (\(m\)) of a solenoid, \[m=n\cdot \cdot A \]

Where . \+Cn\)= number of turns per unit length ,turns / m

\(\)= current throughout the solenoid ,A

\(A\) = cross - sectional area of the solenoid,mm. Electromagnetic induction

- according to Faraday los electromagnetic the induce

_____

16.3.The term Quotient intellectual calculus is term in mathematics or intellectual ass.

- intellectual Quotient ,(iQ) ,the ,IQ is a measure of a personal intellectual abilities in relation to standardise test

- IQ \[\ text {IA}=\ left (\ frac { text { mental age }}{\ text { chronological age }}\ rigth) \ time ,100\]

- mental age : the age level at which a person perform intellectual.

- chronological age : the actual >

2.Quotient in calculus.

If you have two function \ (f(x) and \(g(x)\).the quotient \ [A(X)=\ frac {f(x){g(x)}

3.calxukating the derivative of a quotient , [fract = d}{dx{\ left (\ fract { f (x) }{g(x)\ rigth)

_____

- to analyse psychometric variance ,variance in electrical psychometric field of study concerned with theory of p
psychometric test analysed staatiscally ..

2. Calculating variance is statistics measure that represent the degree of spread in set of value in the of electrica
isots ,x_n\) is calculated using formula

€[| sigma ^2= \ frac { 1}{n}\ sum _ {I=1}^{x_i_\ mu)^2\]

- \(\ sigma ^ 2\)= variance

.(X_1\) = Each inductive . observations

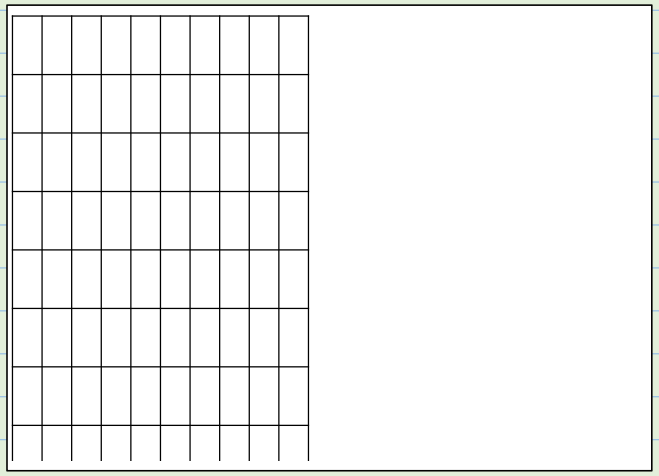
- formulation

_____

In electrical engineering under is crucial for analyse data especially.

1) variance : measure how a set of value differ from the mean of set it quantite the spread of the data paint .

-for a set of \(n\) observt it quantt the spread of the data .



Point formula for variance.

For a set of \(n\) observations \(x_1,x_2,\ isots ,x_ n \)

|[| Sigma ^2=\ frac {1}{n} sum_

{I=1}^{n}(x_1-\mu)^2

Where.\(\ sigma ^ 2))= variance.

.\(n\)= number of observations .

.\(xi)= each individual observation .

.\(| mu\)= mean of thicd ..

---\[|my= \ frac {1}{n} sum _ { I= 1}{n}, x _1\]

_____

2.covariance measure the degree to which two the degree to which two random variables change together indi
(x=(x_1,x-2\dot ,x_ n)\) and \ + y= (y-@,y-2,\ idots ,y-n

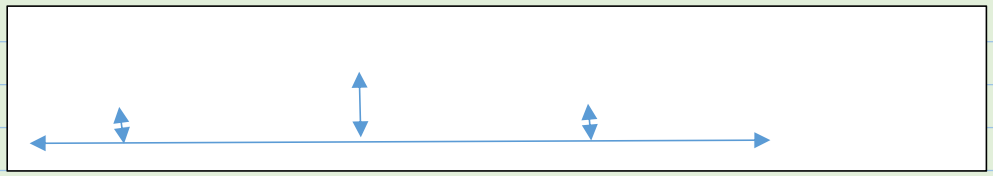
3. Calcul the electrical installation requirements for a building term .

- understanding power and energy .

* Power ,O * measure in kilowatt (kW) it represent the rate at which electrical energy is consumt products .

* Energy ,(E) : measured in kilowatt hour ,kWh it represents.

.\[E= O\ times \ ]



.\(E\)= energy in kWh

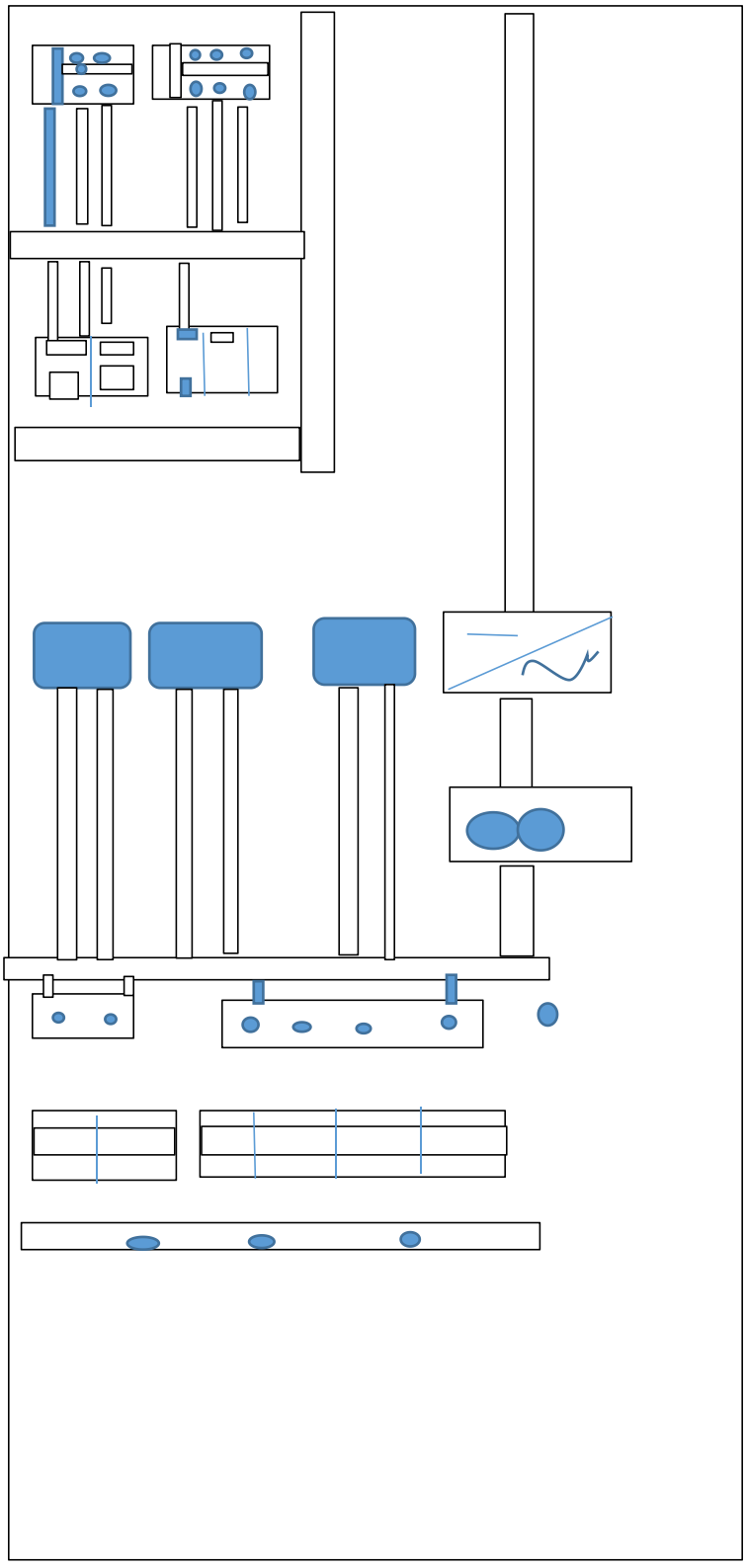
.\(P\)= power in kW

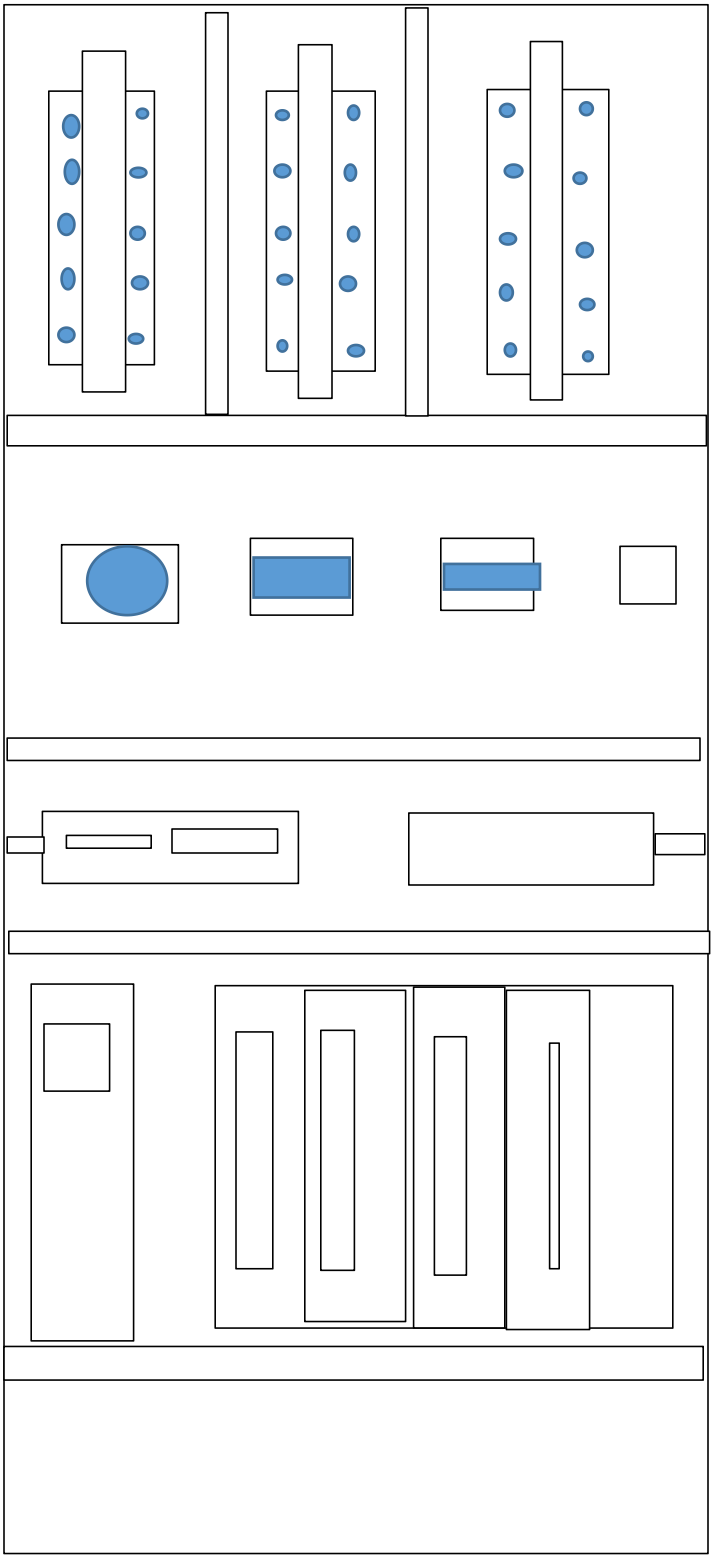
.\(t\) = time in hours .

- 2 calculating total power demand to calculate the total power for a building.

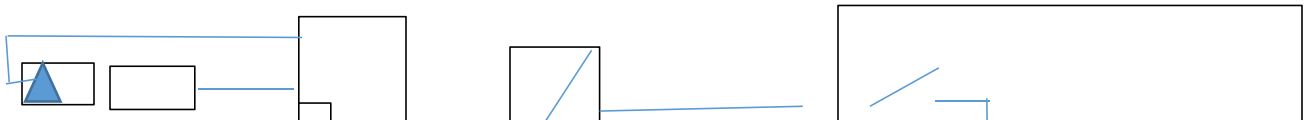
- list of electrical load ligthning ,10 fixtures a ,15 watt each ,HVAC : 3 kW , appliances ,2 kW other equipment ,1 k

2 calculate total power demand ligthning \(10\ text{ fixtures \ times





Pv installation 6.5 to 250kw,grid



'

' Macro1 Macro

' Code resetb and initialize form with default form . Sub reset _form () Dim I row as long With .txt student name.text=” “ Txt student name backcolor +vb white Txt father name .text =”” Txt father name back color + vb white . Txt dob text =”””””””

'

'

```
    Application.Goto Reference:="Macro1"
    ActiveWorkbook.Save
    ActiveWorkbook.Save
    Range("B34").Select
    ActiveSheet.Paste
    Range("B36:Y63").Select
    ActiveSheet.ListObjects.Add(xlSrcRange, Range("$B$36:$Y$63"), , xlNo).Name = _
        "Table16"
    Range("Table16[#All]").Select
    ActiveWindow.ScrollRow = 31
    ActiveWindow.ScrollRow = 30
    ActiveWindow.ScrollRow = 29
    ActiveWindow.ScrollRow = 28
    ActiveWindow.ScrollRow = 27
    ActiveWindow.ScrollRow = 26
    Range("O32").Select
    ActiveWindow.ScrollColumn = 1
    Range("B38").Select
    ActiveCell.FormulaR1C1 = "7"
```

```
    Range("C38").Select
    ActiveCell.FormulaR1C1 = "8"
    Range("D38").Select
    ActiveCell.FormulaR1C1 = "9"
    Range("E38").Select
    ActiveWorkbook.Save
End Sub


Sub Macro2()
'
' Macro2 Macro
' text field  buttons for the number  operator  button for the result  off , clear , back space  option explicit  public class form 1 dim operand 1 as double dim operad 2 as double  dim {operator} as string dim has decimal boolean dim tmp nalue  as double
'

'
    Application.Run _
        "'Copy of PROJECT DRAWING WORKSHET    TSHINGOMBE DESIGN ANALYSE ENGIN Book12.xlsx'!Macro2"
End Sub
Sub Macro3()
'
' Macro3 Macro
' "500000fff03ff000018000a0410000d00095000001"  string .cmd=" "; cmd=cmd+"5000";//sub head (not) cmd=cmd+"00"//network number cmd+cmd+"ff";//plc number cmd+""03ff";//demand object module i/o.number cmd=cmd+"001c";length demand data  cmd=cmd+cmd+000A";cpu in
'

'
End Sub
```

```
UserForm1 - 1
Private Sub Label9_Click()
End Sub
Private Sub OptionButton1_Click()
End Sub
Private Sub OptionButton2_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox2_Change()
End Sub
Private Sub TextBox3_Change()
End Sub
Private Sub TextBox4_Change()
End Sub
Private Sub TextBox6_Change()
End Sub
Private Sub TextBox7_Change()
End Sub
Private Sub TextBox8_Change()
End Sub
Private Sub UserForm_Click()
End Sub
Private Sub UserForm_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub UserForm_Initialize()
End SubUserForm2 - 1
Private Sub CommandButton13_Click()
End Sub
Private Sub CommandButton17_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub CommandButton7_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End SubUserForm3 - 1
Private Sub Label4_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub UserForm_Click()
End SubModule1 - 1
Sub Macro1()
'
' Macro1 Macro
' Code resetb and initialize form with default form . Sub reset _form () Dim I row as long With .tx
t student name.text=" " Txt student name backcolor +vb white Txt father name .text ="" Txt father n
ame back color + vb white . Txt dob text =""""""'
'
```

```
'
Application.Goto Reference:="Macro1"
ActiveWorkbook.Save
ActiveWorkbook.Save
Range("B34").Select
ActiveSheet.Paste
Range("B36:Y63").Select
ActiveSheet.ListObjects.Add(xlSrcRange, Range("$B$36:$Y$63"), , xlNo).Name = _
"Table16"
Range("Table16[#All]").Select
ActiveWindow.ScrollRow = 31
ActiveWindow.ScrollRow = 30
ActiveWindow.ScrollRow = 29
ActiveWindow.ScrollRow = 28
ActiveWindow.ScrollRow = 27
ActiveWindow.ScrollRow = 26
Range("O32").Select
ActiveWindow.ScrollColumn = 1
Range("B38").Select
ActiveCell.FormulaR1C1 = "7"
Range("C38").Select
ActiveCell.FormulaR1C1 = "8"
Range("D38").Select
ActiveCell.FormulaR1C1 = "9"
Range("E38").Select
ActiveWorkbook.Save
End Sub
Sub Macro2()
'
' Macro2 Macro
' text field buttons for the number operator button for the result off , clear , back space optio
n explicit public class form 1 dim operand 1 as double dim operad 2 as double dim {operator} as stri
ng dim has decimal boolean dim tmp nalue as double
'
'
Application.Run _
"'Copy of PROJECT DRAWING WORKSHET TSHINGOMBE DESIGN ANALYSE ENGIN
Book12.xlsx'!Macro2"
End Sub
Sub Macro3()
'
' Macro3 Macro
' "500000fff03ff000018000a0410000d00095000001" string .cmd=" "; cmd=cmd+"5000";//sub head (not) cmd=c
md+"00"//network number cmd+cmd+"ff";//plc number cmd+""03ff";//demand object module i/o.number cmd=cm
d+"001c";length demand data cmd=cmd+cmd+000A";cpu in
'
'
End SubModule2 - 1Class1 – 1

UserForm3 - 1

Private Sub Label4_Click()

End Sub

Private Sub Label5_Click()
```

End Sub

Private Sub TextBox1_Change()

End Sub

Private Sub UserForm_Click()

End Subplc communication program

plc ip adress

plc read data

plc write data

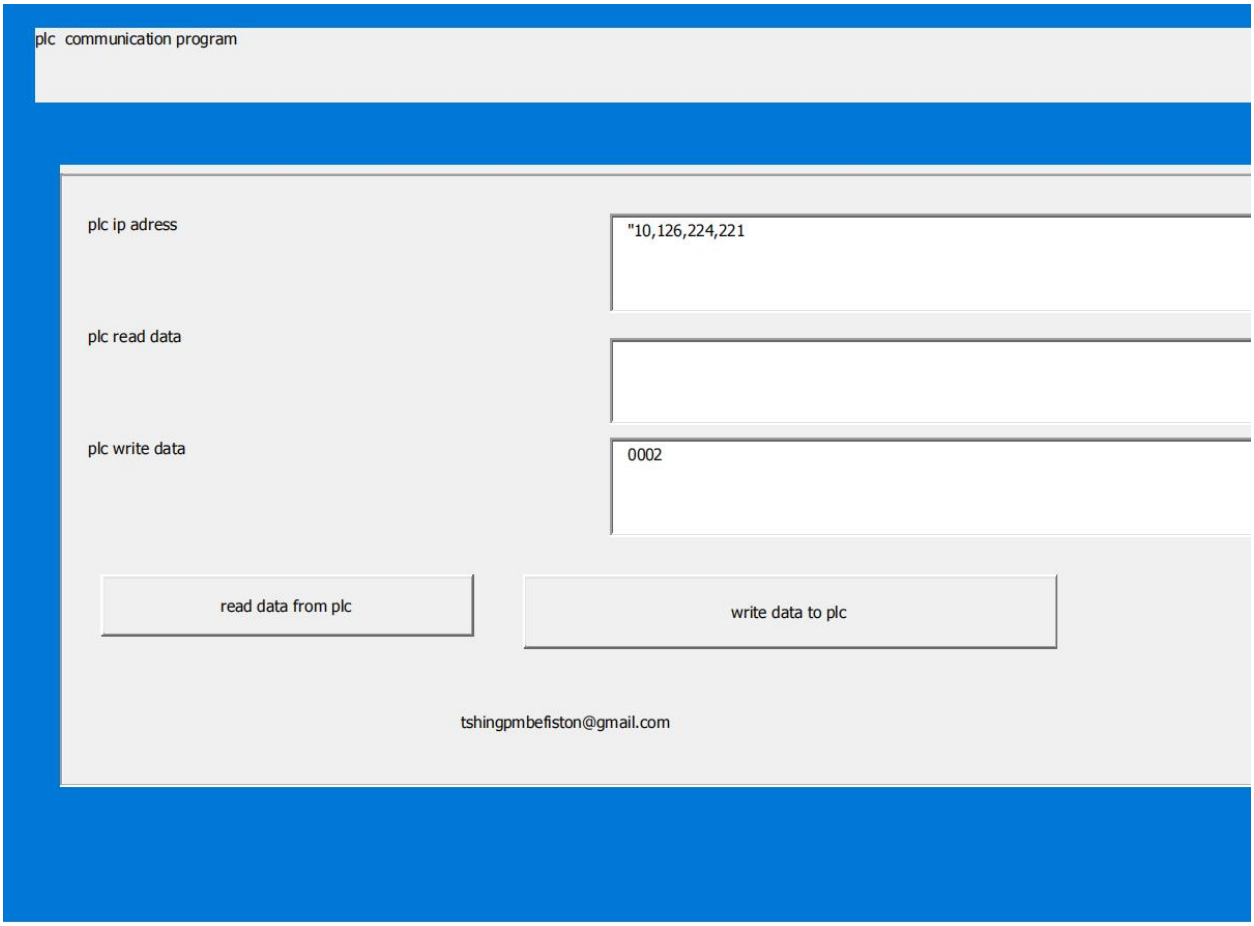
"10,126,224,221

0002

tshingpmbefiston@gmail.com

read data from plc

write data to plc



UserForm2 - 1

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Private Sub CommandButton17_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub CommandButton7_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End Subcalculator
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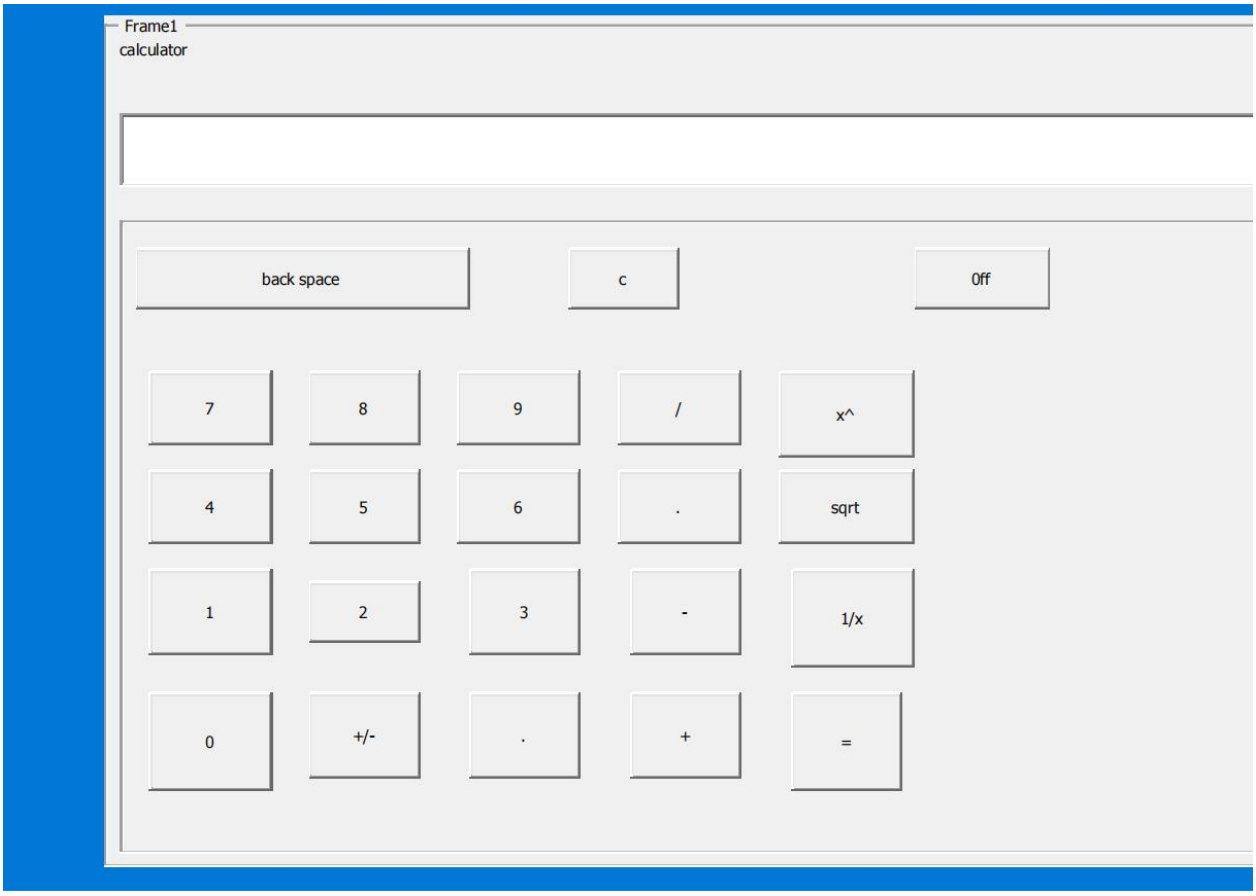
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Follow Me On ..... **Error! Bookmark not defined.**
My Education ..... **Error! Bookmark not defined.**
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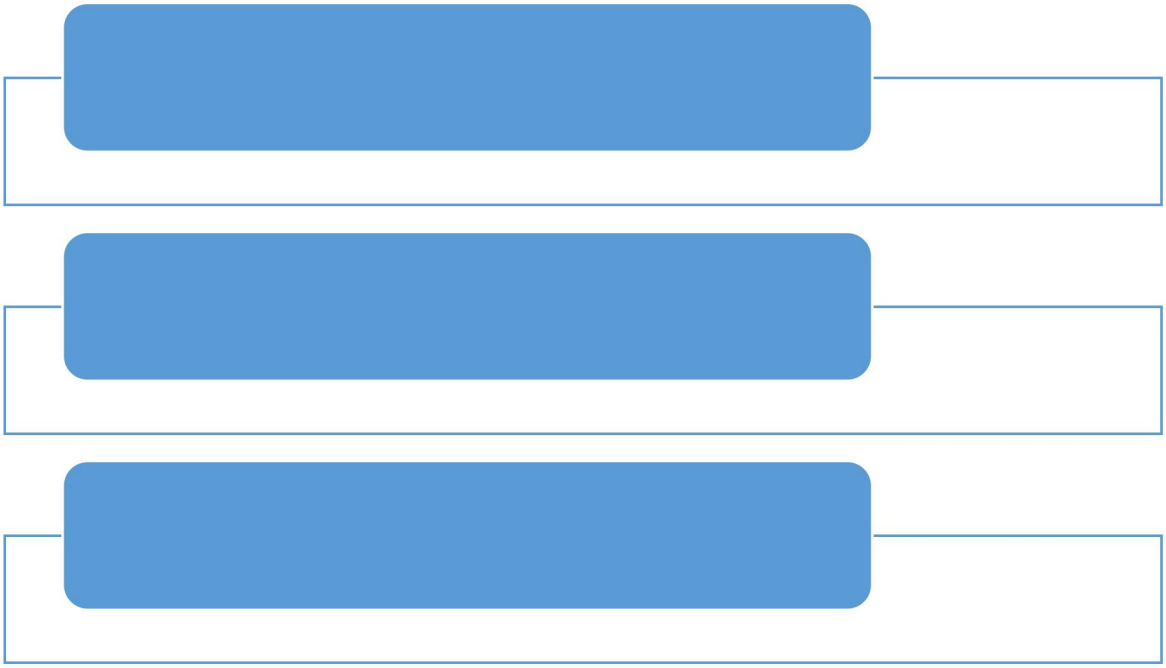

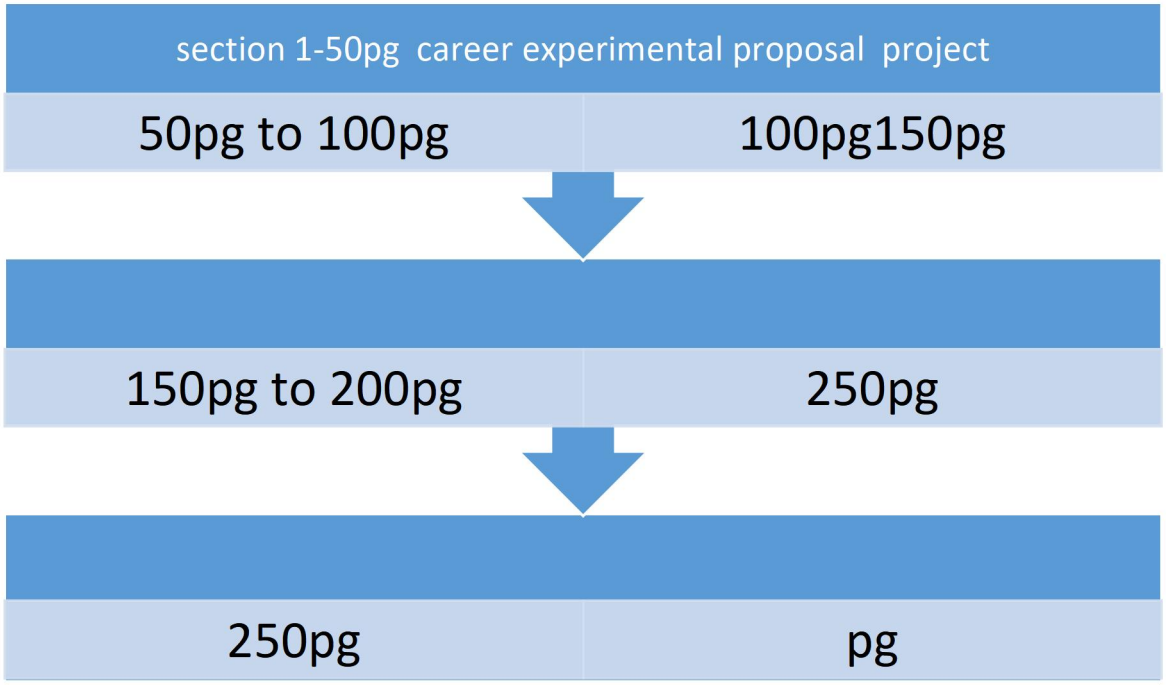

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course title| course objectives| |
course description| | | activity to
-

course title	course objectives	course description	activity to carry out	ID source of
Advanced Electromagnetic Theory	Advanced Electromagnetic Theory: This delves into Maxwell's equations, electromagnetic waves, and their applications in various fields such as antenna design, microwave engineering, and more.	Course Descriptions	Advanced Electromagnetic Theory	Sources for Advanced Electrical Engineering Courses
Digital Signal Processing				
Control Systems Design	Digital Signal Processing (DSP): This involves the analysis and manipulation of signals. It's crucial in areas such as communications, audio and speech processing, radar, and image processing.	Advanced Electromagnetic Theory: This course delves into the intricacies of Maxwell's equations and their applications. Topics include electromagnetic wave propagation, radiation, and scattering. Students will learn to design and analyze antennas, microwave circuits, and other electromagnetic devices.	Objectives:	1.
Advanced Communication Systems				Advanced Electromagnetic Theory
Power Systems Engineering	Control Systems Design: This focuses on designing systems that can control the behavior of other systems. Applications include robotics, aerospace, automotive systems, and industrial automation.	Digital Signal Processing (DSP): This course focuses on the principles and applications of discrete-time signal processing. Topics covered include sampling, digital filter design, Fourier transforms, and signal analysis. Students will gain hands-on experience with MATLAB/Python for implementing DSP algorithms.	•	

Renewable Energy Systems			Understand Maxwell's equations and their applications.	2.
VLSI (Very Large Scale Integration) Design	Advanced Communication Systems: This covers the principles and technologies behind modern communication systems, including wireless communications, fiber optics, and satellite communications.	Control Systems Design: This course covers the design and analysis of feedback control systems. Students will learn about root locus, frequency response, and state-space methods for controller design. Applications include robotics, aerospace, and automotive systems.		1.
Machine Learning in Electrical Engineering			•	Books: "Classical Electrodynamics" by John David Jackson, "Principles of Electrodynamics" by Melvin Schwartz
	Power Systems Engineering: This involves the generation, transmission, and distribution of electrical power. It covers topics such as power system stability, smart grids, and renewable energy integration.	Advanced Communication Systems: This course explores the principles of modern communication systems. Topics include modulation and demodulation, noise analysis, and the design of wireless and optical communication systems. Students will also study the latest advancements in communication technologies.	•	
			Analyze electromagnetic wave propagation in different media.	2.
	Renewable Energy Systems: This explores the technologies and systems used to generate energy from renewable sources like solar, wind, and hydroelectric power. It's increasingly important for sustainable development.	Power Systems Engineering: This course covers the generation, transmission, and distribution of electrical power. Topics include power system stability, protection, and smart grids. Students will also learn about the integration of renewable energy sources into power grids.		3.
			•	Online Courses: MIT OpenCourseWare, Coursera

	VLSI (Very Large Scale Integration) Design: This involves designing and creating integrated circuits with millions of transistors on a single chip. It's essential for the development of modern electronic devices.	Renewable Energy Systems: This course examines the technologies and systems used to generate energy from renewable sources such as solar, wind, and hydroelectric power. Topics include energy conversion, efficiency analysis, and the design of renewable energy systems.	•	
			Design and analyze antennas and microwave circuits.	4.
	Machine Learning in Electrical Engineering: This examines the application of machine learning techniques to solve problems in electrical engineering, such as predictive maintenance, signal processing, and system optimization	VLSI (Very Large Scale Integration) Design: This course focuses on the principles of designing integrated circuits with millions of transistors. Topics include digital and analog circuit design, fabrication processes, and the use of VLSI design tools. Students will gain practical experience in designing and simulating VLSI circuits.		3.
			•	Digital Signal Processing (DSP)
	Advanced Electromagnetic Theory: This delves into Maxwell's equations, electromagnetic waves, and their applications in various fields such as antenna design, microwave engineering, and more.	Machine Learning in Electrical Engineering: This course introduces the application of machine learning techniques to solve electrical engineering problems. Topics include supervised and unsupervised learning, neural networks, and deep learning. Students will apply machine learning to areas such as predictive maintenance, signal processing, and system optimization.	Activities:	
				4.
	Digital Signal Processing (DSP): This involves the analysis and manipulation of signals. It's crucial in areas such as communications, audio and speech processing, radar, and image processing.	These descriptions should give a comprehensive overview of each course. If you need more detailed information on any specific topic or have any other questions, feel free to ask!	•	1.

Engi

a

ure! Here is a basic database schema for an online merch store:

Entities:
1. Users:tshingombe tshitadi fiston
- username: tshingombe fiston
- email: tshingombefiston@gmail.com
- password

2. Products
- product_id
- product_name: engineering thesis journal assement
- description: engineering
- price
- category_id

3. Categories
- category_id (
- category_name

4. Orders
- order_id
- user_id
- order_date
- total_amount: 50000$

5. OrderDetails
- order_detail_id
- order_id
- product_id
- quantity
- subtotal

Relationships:
- One user can have multiple orders (One-to-Many)
- One order can have multiple products (One-to-Many)
- One product can belong to one category (Many-to-One)

This is a basic schema and can be expanded based on additional requirements such as product variations, discounts, shipping details, etc.
  #(Token Used By this Response 259)

Entities:
1. Users
- user_id (Primary Key)
- username: tshingombe fiston
- email: tshingombefiston@gmail.com
- password

2. Products
- product_id (Primary Key)
- product_name: engineering thesis journal assessment
- description: engineering
- price
- category_id

3. Categories
- category_id (Primary Key)
- category_name

4. Orders
- order_id (Primary Key)
- user_id (Foreign Key referencing Users)
- order_date
- total_amount: $50000

5. OrderDetails
- order_detail_id (Primary Key)
- order_id (Foreign Key referencing Orders)
- product_id (Foreign Key referencing Products)
- quantity
- subtotal
Thank you for providing the information. Based on the input given, I will proceed to create a personal webpage for you with the following details:

Personal Webpage for Kananga5

Color Scheme: Blue and White
Theme: Professional and Academic
Content/Sections:
1. Introduction
2. Academic Achievements and Research Topics

3. University Thesis Publications
4. Contact Information

Short Bio:
Kananga5 is a dedicated researcher and academic enthusiast with a passion for exploring diverse topics within their field of study. Their academic journey has led to numerous achievements and publications, including notable work on diverse university thesis topics
In a Master of Science in Electrical Engineering (MSEE) program with a focus on electrical and industrial electronics, you may encounter a range of core courses and topics that form the foundation of your studies. Here are some common core courses and topics you may expect to encounter in this specialization:

1. **Power Systems Analysis**:
   - Power System Stability
   - Power Flow Analysis
   - Fault Analysis
   - Power System Protection

2. **Industrial Electronics**:
   - Power Electronics
   - Variable Frequency Drives
   - Industrial Automation
   - Control Systems

3. **Electric Machines and Drives**:
   - Electric Machine Design
   - Motor Control Techniques
   - Electric Drives
   - Electromagnetic Field Theory

4. **Embedded Systems**:
   - Microcontroller Programming
   - Real-time Operating Systems
   - Embedded System Design
   - Interface and Communication Protocols

5. **Signal Processing**:
   - Digital Signal Processing
   - Image Processing
   - Audio Processing
   - Filter Design

6. **Control Systems**:
   - Feedback Control Systems
   - State-Space Analysis
   - PID Controllers
   - Robust Control

7. **Communication Systems**:
   - Digital Communication
   - Wireless Communication
   - Optical Communication
   - Modulation Techniques

8. **Electrical Design and Testing**:

- Circuit Design
- PCB Design
- Testing and Troubleshooting
- Reliability Engineering

When working on your thesis in electrical engineering with a focus on electrical and industrial electronics, you may explore advanced topics within these areas and conduct research on cutting-edge technologies and applications. It is essential to stay updated on industry trends, advancements, and emerging technologies to excel in this field.

Please note that specific course offerings and topics may vary depending on the university and the program curriculum. It is recommended to consult with your academic advisor or program coordinator for a detailed outline of the courses and topics

It seems like you're looking to combine trade theory, electrical engineering, electronics, and mathematics in your thesis. Here is a potential thesis topic that integrates these areas:

Title: "Integration of Trade Theory in the Design and Optimization of Electrical and Electronic Systems using Mathematical Models"

Abstract:
This thesis explores the integration of trade theory principles in the field of electrical engineering and electronics to optimize the design and functionality of complex systems. By leveraging mathematical models and economic concepts, this study aims to enhance the efficiency, cost-effectiveness, and performance of electrical and electronic systems in various industries.

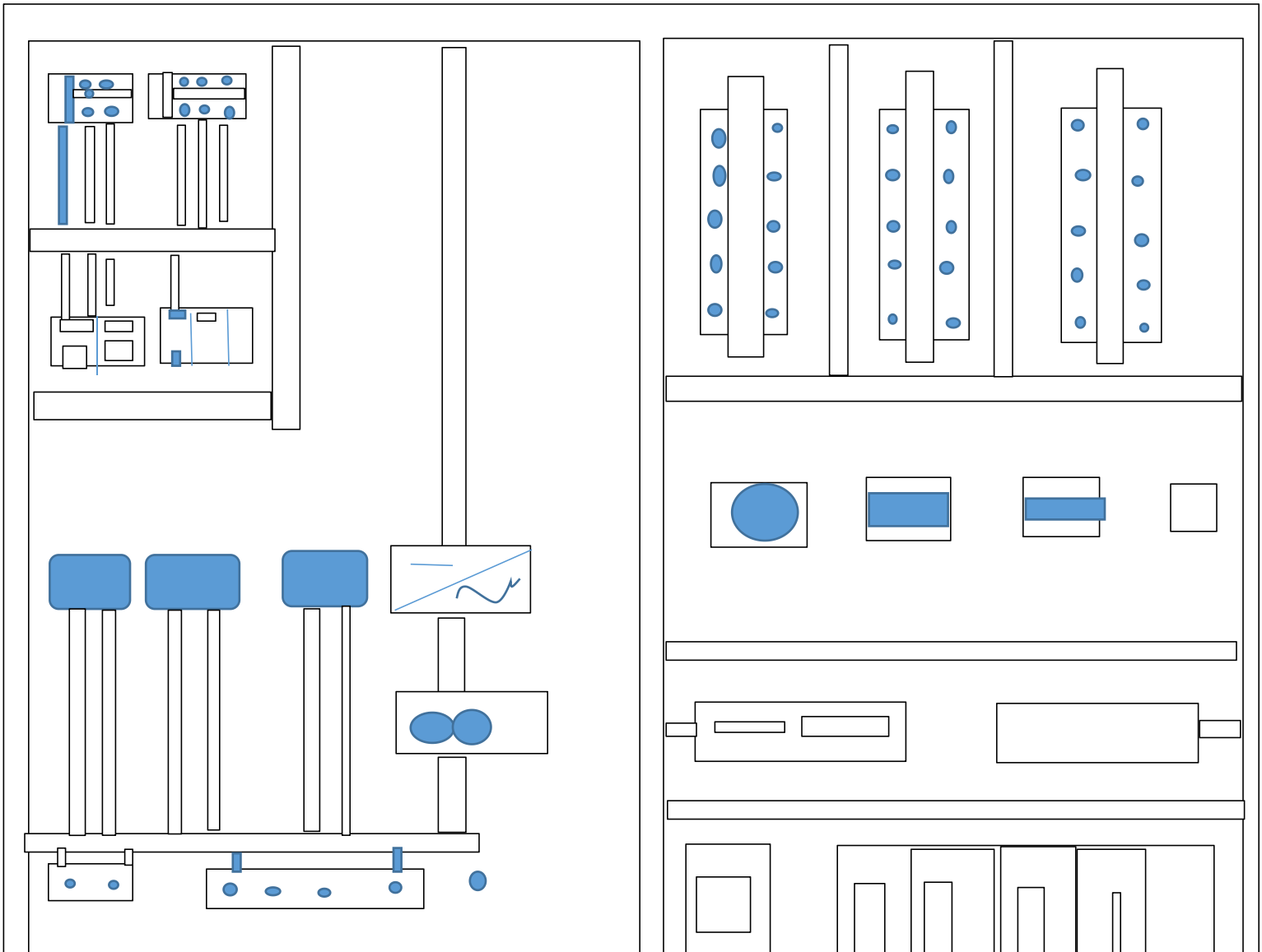
Research Objectives:
1. Investigate the key principles of trade theory and their applicability in the field of electrical engineering and electronics.
2. Develop mathematical models to represent the interplay between trade-offs, costs, and performance in system design.
3. Analyze case studies to demonstrate the application of trade theory in optimizing electrical and electronic systems.
4. Evaluate the impact of integrating trade theory and mathematical models on the efficiency and sustainability of complex systems.

Methodology:
- Review existing literature on trade theory, electrical engineering principles, and mathematical modeling techniques.
- Develop a framework for integrating trade theory concepts with mathematical models for system optimization.
- Conduct case studies and simulations to demonstrate the practical implications of the proposed approach.
- Analyze the results and draw conclusions on the benefits of incorporating trade theory in electrical and electronic system design.

Potential Contributions:
- This thesis aims to bridge the gap between trade theory and engineering disciplines, offering a novel perspective on system design and optimization.
- The findings could provide valuable insights for practitioners in the field of electrical engineering, electronics, and trade economics.

- The integration of mathematical modeling and trade theory concepts may lead to more efficient and sustainable solutions in complex systems.

By focusing on the intersection of trade theory, electrical engineering, electronics, and mathematics, this thesis has the potential to make a significant contribution to the advancement of interdisciplinary research and innovation in these field



'

' Macro1 Macro

' Code resetb and initialize form with default form . Sub reset _form () Dim I row as long With .txt student name.text=” “ Txt student name backcolor +vb white Txt father name .text =”” Txt father name back color + vb white . Txt dob text =”””””’

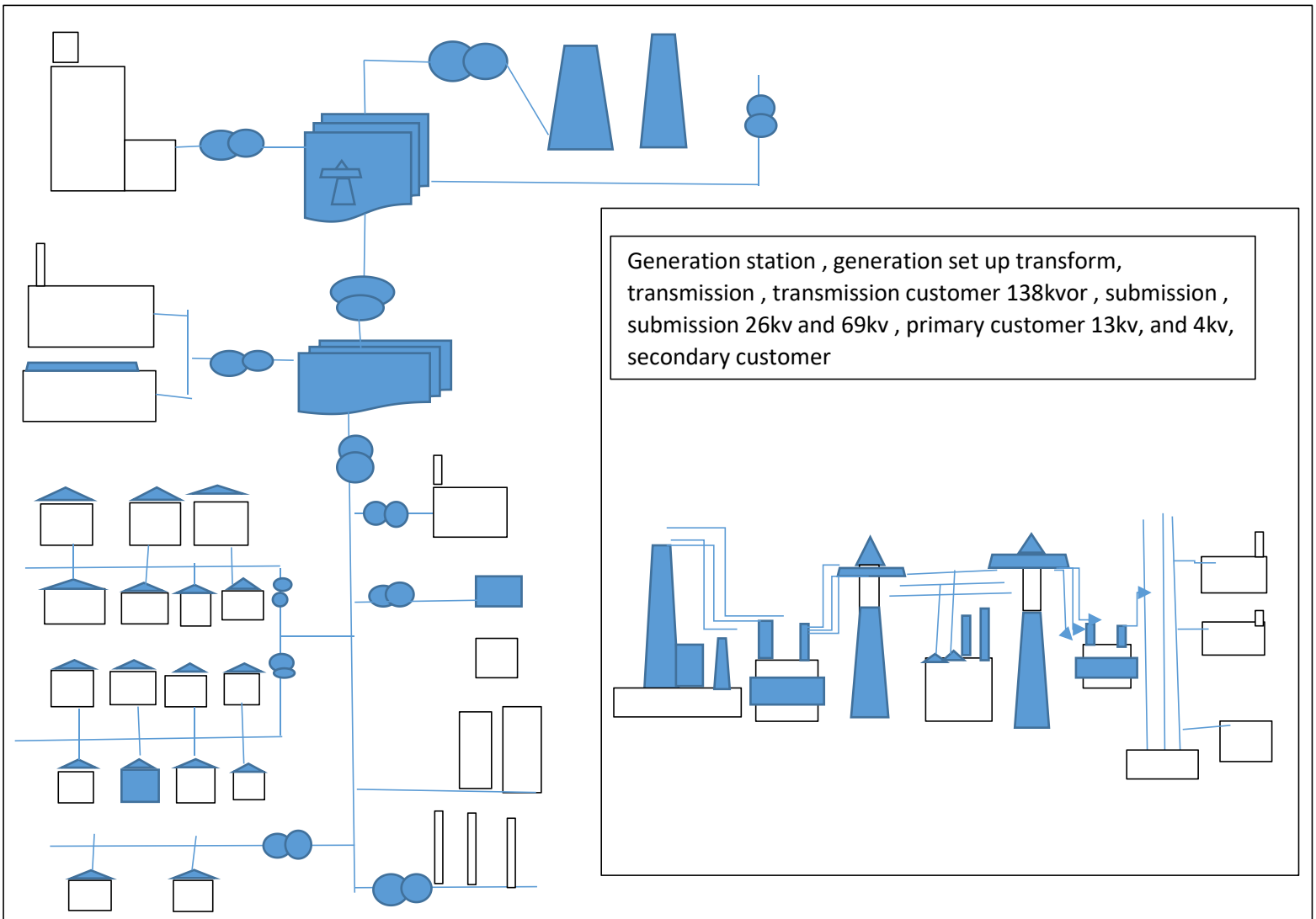
'

'

```
    Application.Goto Reference:="Macro1"
    ActiveWorkbook.Save
    ActiveWorkbook.Save
    Range("B34").Select
    ActiveSheet.Paste
    Range("B36:Y63").Select
```

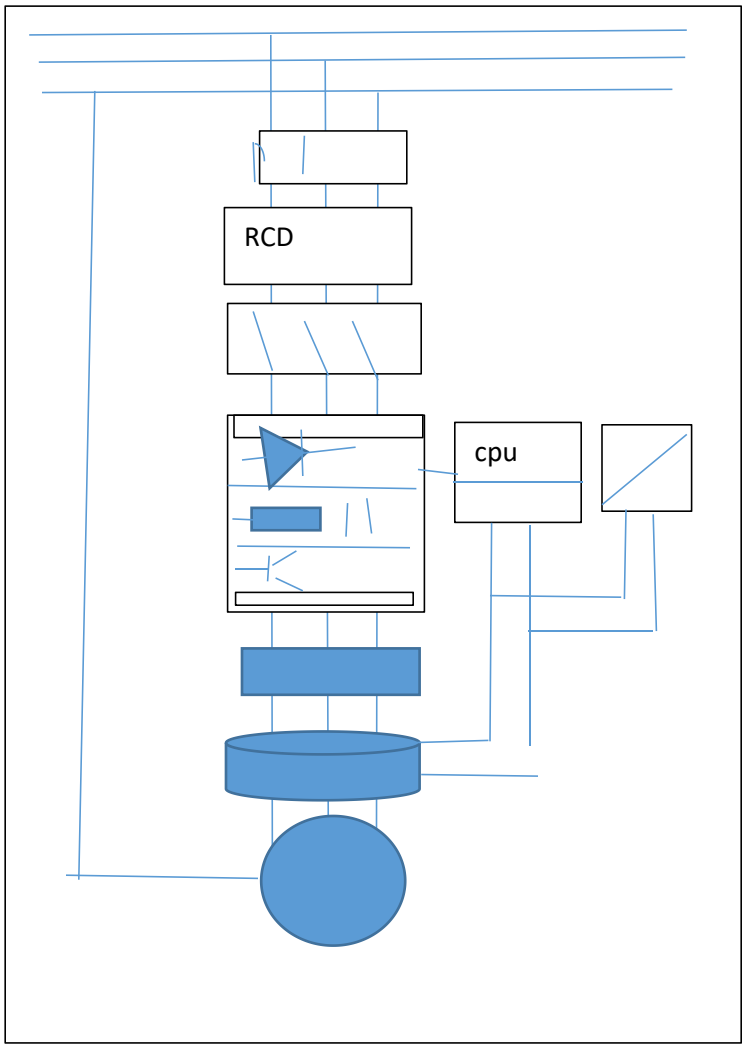
```
    ActiveSheet.ListObjects.Add(xlSrcRange, Range("$B$36:$Y$63"), , xlNo).Name = _
        "Table16"
    Range("Table16[#All]").Select
    ActiveWindow.ScrollRow = 31
    ActiveWindow.ScrollRow = 30
    ActiveWindow.ScrollRow = 29
    ActiveWindow.ScrollRow = 28
    ActiveWindow.ScrollRow = 27
    ActiveWindow.ScrollRow = 26
    Range("O32").Select
    ActiveWindow.ScrollColumn = 1
    Range("B38").Select
    ActiveCell.FormulaR1C1 = "7"
    Range("C38").Select
    ActiveCell.FormulaR1C1 = "8"
    Range("D38").Select
    ActiveCell.FormulaR1C1 = "9"
    Range("E38").Select
    ActiveWorkbook.Save
End Sub


Sub Macro2()
'
' Macro2 Macro
' text field  buttons for the number  operator  button for the result  off , clear , back space  option explicit  public class form 1 dim operand 1 as double dim operad 2 as double  dim {operator} as string dim has decimal boolean dim tmp nalue  as double
'


'
```

```
    Application.Run _

        "'Copy of PROJECT DRAWING WORKSHET    TSHINGOMBE DESIGN ANALYSE ENGIN
Book12.xlsx'!Macro2"

End Sub

Sub Macro3()

'

' Macro3 Macro

' "500000fff03ff000018000a0410000d00095000001"  string .cmd=" "; cmd=cmd+"5000";//sub head (not)
cmd=cmd+"00"//network number cmd+cmd+"ff";//plc number cmd+""03ff";//demand object module
i/o.number cmd=cmd+"001c";length demand data  cmd=cmd+cmd+000A";cpu in

'
```


Generation station , generation set up transform, transmission , transmission customer 138kvor , submission , submission 26kv and 69kv , primary customer 13kv, and 4kv, secondary customer
Ups bpm connection diagrams

Vt kw

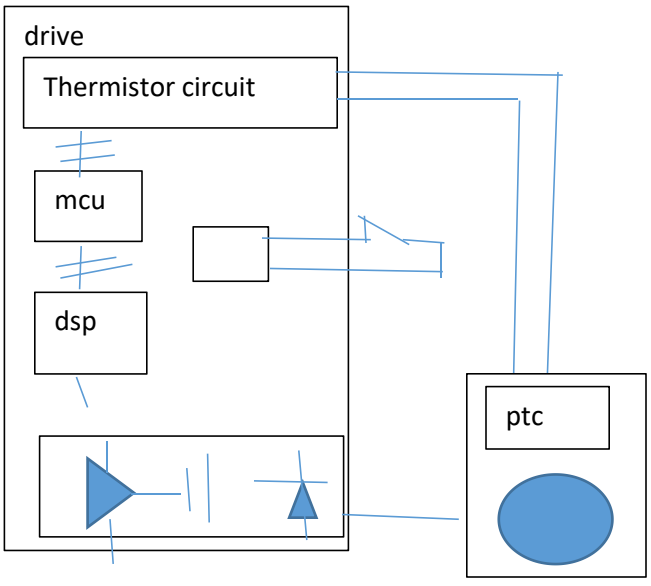
Ct output c

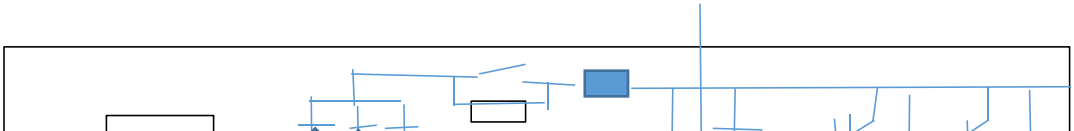


Ister , motor and application, motor and application , item ,

Power grid , configuration input output voltage , breakers , fuse , cable, cross. Section .

- Protection person, and animals, input disconector frequence disconnect , inverter mounting , output reactor, dv/dt filter , motor protector, m





frm1 - 1
```
Private Sub ComboBox1_Change()
End Sub
Private Sub ComboBox2_Change()
End Sub
Private Sub ComboBox3_Change()
End Sub
Private Sub ComboBox4_Change()
End Sub
Private Sub ComboBox5_Change()
End Sub
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label2_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub Label6_Click()
End Sub
Private Sub TextBox1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.DataO
```

```
bject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect As M
SForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Action As
MSForms.
fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal Effect As MSFo
rms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox1_DblClick(ByVal Cancel As MSForms.ReturnBoolean)frm1 - 2
End Sub
Private Sub TextBox1_DropButtonClick()
End Sub
Private Sub TextBox1_Enter()
End Sub
Private Sub TextBox1_Error(ByVal Number As Integer, ByVal Description As MSForms.ReturnString, ByVal S
Code As Long, ByVal Source As String, ByVal HelpFile As String, ByVal HelpContext As Long, ByVal Cance
lDisplay As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox1_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub TextBox1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox1_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox1_MouseMove(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox1_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End SubUserForm1 - 1
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Frame1_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub TextBox1_Change()
End Sub
Private Sub TextBox2_Change()
End Sub
Private Sub TextBox3_Change()
End Sub
Private Sub TextBox4_AfterUpdate()
```

```
End Sub
Private Sub TextBox4_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.DataO
bject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect As M
SForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Action As
MSForms.
fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal Y As Single, ByVal Effect As MSFo
rms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_Change()
End Sub
Private Sub TextBox4_DblClick(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_DropButtonClick()
End SubUserForm1 - 2
Private Sub TextBox4_Enter()
End Sub
Private Sub TextBox4_Exit(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub TextBox4_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub TextBox4_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub TextBox4_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox4_MouseMove(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub TextBox4_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End Sub
Private Sub UserForm_Click()
End SubUserForm3 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub ListBox1_Click()
End Sub
Private Sub SpinButton1_AfterUpdate()
End Sub
Private Sub SpinButton1_BeforeDragOver(ByVal Cancel As MSForms.ReturnBoolean, ByVal Data As
MSForms.Da
```

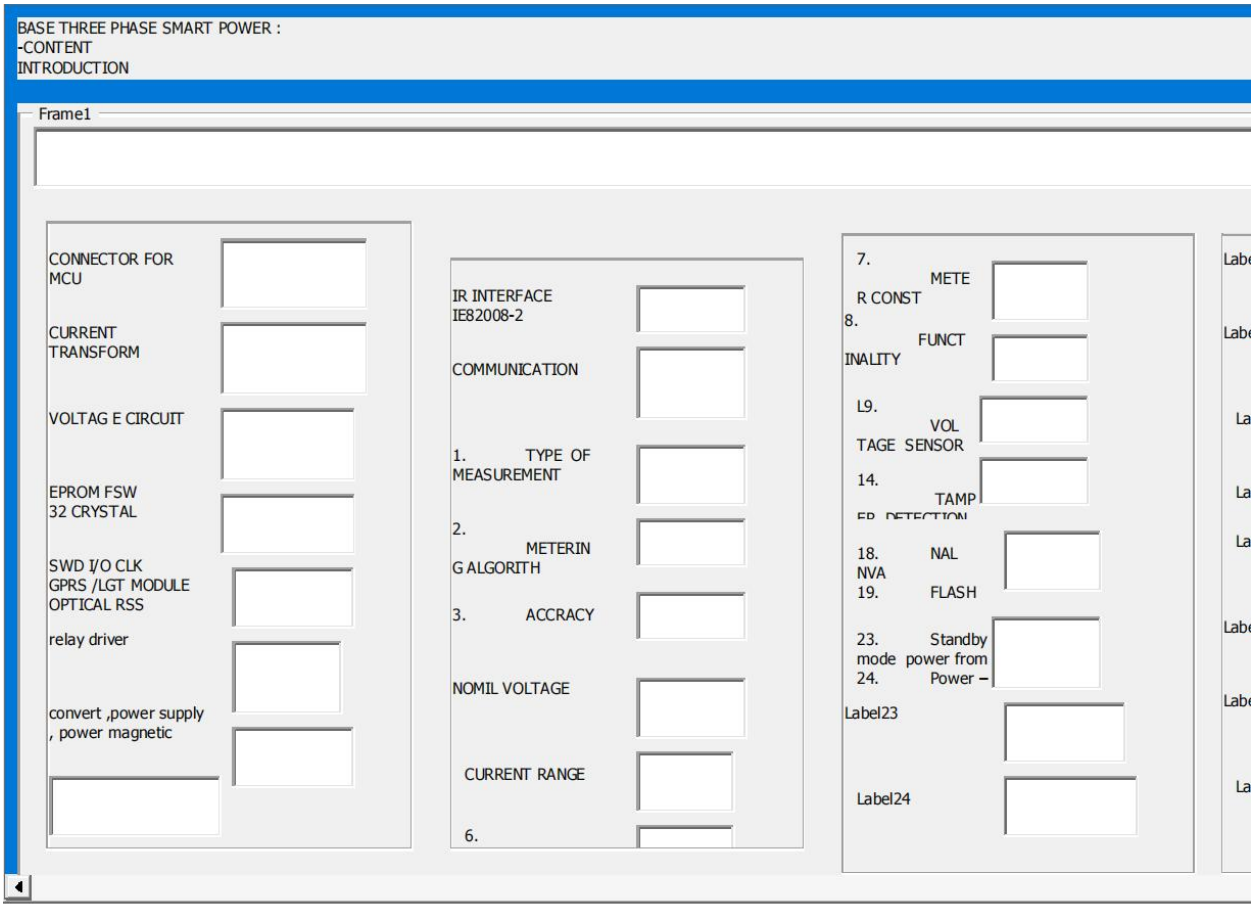
```
taObject, ByVal X As Single, ByVal Y As Single, ByVal DragState As MSForms.fmDragState, ByVal Effect A
s MSForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub SpinButton1_BeforeUpdate(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub SpinButton1_Change()
End Sub
Private Sub SpinButton1_Enter()
End Sub
Private Sub SpinButton1_Exit(ByVal Cancel As MSForms.ReturnBoolean)
End Sub
Private Sub SpinButton1_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub SpinButton1_KeyUp(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub SpinButton1_SpinDown()
End SubUserForm5 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub UserForm_Activate()
End Sub
Private Sub UserForm_AddControl(ByVal Control As MSForms.Control)
End Sub
Private Sub UserForm_BeforeDropOrPaste(ByVal Cancel As MSForms.ReturnBoolean, ByVal Control As
MSForms
.Control, ByVal Action As MSForms.fmAction, ByVal Data As MSForms.DataObject, ByVal X As Single, ByVal
Y As Single, ByVal Effect As MSForms.ReturnEffect, ByVal Shift As Integer)
End Sub
Private Sub UserForm_Click()
End Sub
Private Sub UserForm_Error(ByVal Number As Integer, ByVal Description As MSForms.ReturnString, ByVal S
Code As Long, ByVal Source As String, ByVal HelpFile As String, ByVal HelpContext As Long, ByVal Cance
lDisplay As MSForms.ReturnBoolean)
End Sub
Private Sub UserForm_Initialize()
End Sub
Private Sub UserForm_KeyDown(ByVal KeyCode As MSForms.ReturnInteger, ByVal Shift As Integer)
End Sub
Private Sub UserForm_KeyPress(ByVal KeyAscii As MSForms.ReturnInteger)
End Sub
Private Sub UserForm_MouseDown(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByV
al Y As Single)
End Sub
Private Sub UserForm_MouseUp(ByVal Button As Integer, ByVal Shift As Integer, ByVal X As Single, ByVal
Y As Single)
End Sub
Private Sub UserForm_RemoveControl(ByVal Control As MSForms.Control)
End Sub
Private Sub UserForm_Resize()
End Sub
Private Sub UserForm_Terminate()
End SubUserForm7 - 1
Private Sub ComboBox1_Change()
End Sub
Private Sub ComboBox2_Change()
End Sub
```

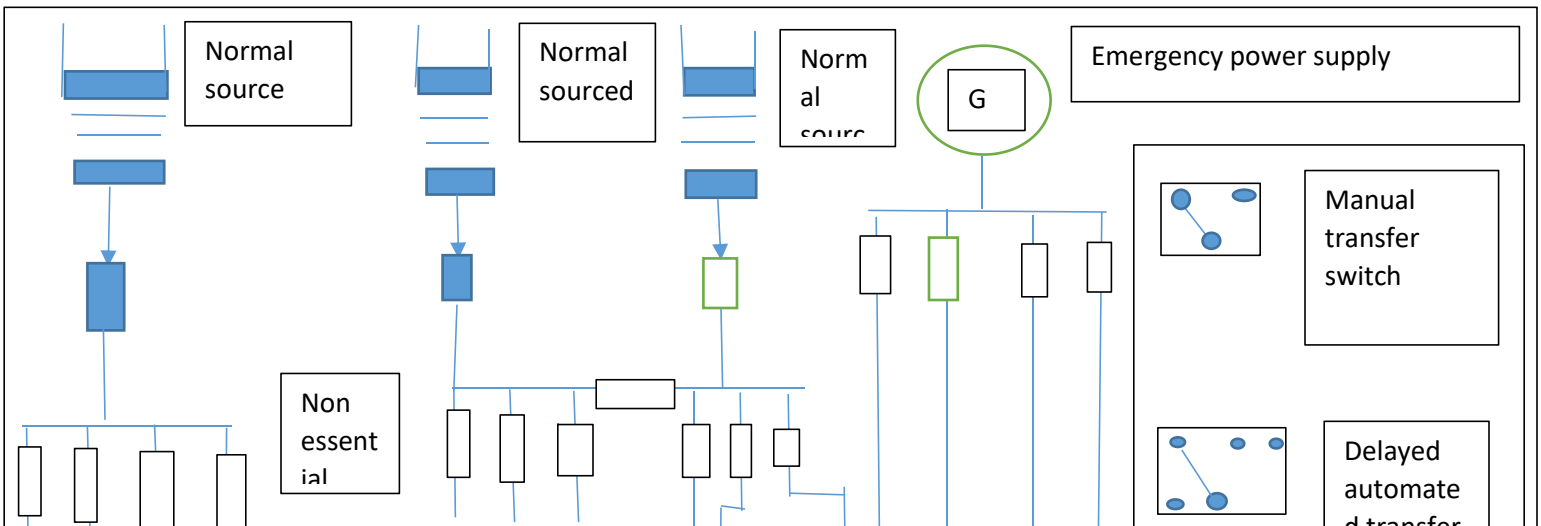
```
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
End Sub
Private Sub CommandButton5_Click()
End Sub
Private Sub CommandButton6_Click()
End Sub
Private Sub CommandButton8_Click()
End Sub
Private Sub CommandButton9_Click()
End Sub
Private Sub Label1_Click()
End Sub
Private Sub Label2_Click()
End Sub
Private Sub Label3_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub ListBox1_Click()
End Sub
Private Sub ScrollBar1_Change()
End Sub
Private Sub UserForm_Activate()
End Sub
Private Sub UserForm_Click()
End SubUserForm8 - 1
Private Sub Frame1_Click()
End Sub
Private Sub Frame3_Click()
End Sub
Private Sub Frame5_Click()
End Sub
Private Sub Label13_Click()
End Sub
Private Sub Label14_Click()
End Sub
Private Sub Label5_Click()
End Sub
Private Sub TextBox11_Change()
End SubModule2 - 1Module3 - 1
Sub frm1()
End SubModule4 - 1
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End
Caption = "UserForm1"
ClientHeight = 8664
ClientLeft = 108
ClientTop = 456
ClientWidth = 19884
OleObjectBlob = "frm1tshingombe.frx":0000
```

```
StartUpPosition = 1 'CenterOwner
WhatsThisButton = -1 'True
WhatsThisHelp = -1 'True
End
Attribute VB_Name = "frm1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
End Sub
End Sub
End Sub
End Sub
Private Sub Frame1_Click()VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm3
Caption = "UserForm3"
ClientHeight = 7476
ClientLeft = 108
ClientTop = 456
ClientWidth = 19812
OleObjectBlob = "UserForm3tshingombe.frx":0000
StartUpPosition = 3 'Windows Default
WhatsThisButton = -1 'True
WhatsThisHelp = -1 'True
End
Attribute VB_Name = "UserForm3"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = FalseNewMacros - 1
Sub Macro1()
'
' Macro1 Macro
' visual basic atm program .sten object by system .event )hand
' "&chr(10)&"public class transaction box
' "&chr(10)&"const service as decimal =6.5
' "&chr(10)&"const pin as integer +9343
' "&chr(10)&"dim balance as decimal =150
' "&chr(10)&"private sub label 12_click (by sender System.object event arg handles labe
'
End SubClass3 - 1Class4 - 1
Private Sub CommandButton1_Click()
End Sub
Private Sub CommandButton2_Click()
End Sub
Private Sub CommandButton3_Click()
```

```
UserForm9 - 1
Private Sub Frame3_Click()
End Sub
Private Sub TextBox6_Change()
End Sub
```
BASE THREE PHASE SMART POWER :

-CONTENT
INTRODUCTION
SERIES MKM35512 SERIES
CONNECTOR FOR
MCU
CURRENT
TRANSFORM
VOLTAG E CIRCUIT
EPROM FSW
32 CRYSTAL
SWD I/O CLK
GPRS /LGT MODULE
OPTICAL RSS
OPTICAL
relay driver
convert ,power supply
, power magnetic
IR INTERFACE
IE82008-2
COMMUNICATION
1. TYPE OF
MEASUREMENT
2.
METERIN
G ALGORITH
3. ACCRACY
NOMIL VOLTAGE
CURRENT RANGE
6.
NOMIN
7.
METE
R CONST
8.(IMP/KWH,M /K
FUNCT
INALITY
L9.
VOL
TAGE SENSOR
10.
14.
TAMP
ER DETECTION
18. NAL
NVA
19. FLASH
20.
23. Standby
mode power from
24. Power –
down power
Label23
Label24
Label25
Label26
Label27
Label28
Label29
Label30
Label31
Label32
Frame1


BASE THREE PHASE SMART POWER :
-CONTENT
INTRODUCTION
Frame1
CONNECTOR FOR MCU
CURRENT TRANSFORM
VOLTAG E CIRCUIT
EPROM FSW 32 CRYSTAL
SWD I/O CLK
GPRS /LGT MODULE
OPTICAL RSS
relay driver
convert ,power supply , power magnetic
IR INTERFACE IE82008-2
COMMUNICATION
1. TYPE OF MEASUREMENT
2. METERIN G ALGORITH
3. ACCRACY
NOMIL VOLTAGE
CURRENT RANGE
6.
7. METE R CONST
8. FUNCT INALITY
L9. VOL TAGE SENSOR
14. TAMP
18. NAL NVA
19. FLASH
23. Standby mode power from
24. Power –
Label23
Label24


Normal source
Normal sourced
Norm al sourc
G
Emergency power supply
Manual transfer switch
Non essent ial
Delayed automate d transfer

Breakers calculat on a symmetrical current rating : fault calculation : on note interrupted capabilities ,I1,and ,I2,a

- 13,8 kV ,,breakers x/R= 15, 375 MVA,transfo 13,8 kV primary ,3750kva , secondary ,4,16 ,,,50vpc ,w

On system,13,8 kV system ,3,75 MVA base ,

Z=3.75MVA/375,,= 0,01 Pu or 1%

Z^2=X^2+RR^2=R^2(x^2/R^2+1)

R=Z/√x^2/R^2+1=1/√266=1/15.03=0,066%

X=X/R(R)=15(0,0066)=99%

Transformer standard standard ,5,5% impedance has ,+ 75 manufacture toleri,

Transformer standard ,5,5% impedance ..

From transformer loss per unit percent ,R is calcul .

31,000 watts full load

-6,800 watt no load load

_____

24,209 watt load losses

R= 24,2kw/3750 KVA = 0,0065 Pu or ,0,65%

- transform x = √ z^ 2-R^2.√(5.09)^2-(0,65)^2=√25.9 ^2-0,42=√25,48=5,05%

_____

	X.	R.	X/ R
13,8 kV system	0,98%.	0,066%.	15
Transfo.	5,05%.	0,65%.	8
Systt total.	0,04%.	0,76%.	8

.tree

For three phase ,i3 phase = E/x ,,

X ohm ..

I3 phase = IB/X,, IB is base ,,

- base current IB = 3,75MVA/√3(4,16Kv)=0,52k.A

I3 phase = I1/ x = 0,52 /0,0604=8,6k, sym ,,syst ,x/ R= 9 is less 15

Duty circuit ,is 8,6 ka three phase I and moment ..

8,6× 1,6 = 13,7 KA. I 3

- for line - to grounv fault ,

ILG = 3E/2x1+X0=4IB/2x1+xo ,xo is seauet reactance transformer positive ..

ILG= 3(0,52)/2+0,0604)+(0,0505=9,@KA sym ..

The ,50 vcp ,, applied,z= x ,in= x = 0,52/0,55=9,5ka stm ,

X/ R ration ,15 or less multiot ,10 for short circuit bdury ,short circuit duty is then 8,5 kA ,sym ,(I1,I2) and momer

_____

Design distributor system

drawing note / build..

_____

1.***4.1.2.5.***Fault calculation check break application or generator bus for the system generator shoe each generato
pu ,

Gen ,x/R ratio ,30.

1/X's= 1/x+1/x+1/x== 3and 1/Rs= 1/R+;1/R+1/R=3/R..

X's= x/3and Rs ,= Rs=R/3,, system ,X's/Rs = x/R= gen .x/R=39,, generator neutral grounding reactor are used to lir
Amper ,system ,x/R of I multiple b..short circuit duty is 28,4 (29,5 symetricaj ..

-Three phase symmetrical interri capacity

_____

Breaker type|vmax| max ki| at 4,16 op vo

1.***4.1.2.6.***Overview : research in training and .university and college ,cpd learning

campagnie work base : experiemental.

Module ,construction distribution system design

- describe between fault current peak ,value ,RMS symmetrical value .RMS , asymmetric value ,X/R ratio ,

I= symmetrical RMS current ,IP = peak current,e= 2,71,wv,= 2.p.f ..

Cycle (ANSI/IEEE.C37.13.2.2015..

-Design a distribution system.

-Developm of a system one - line ..imp, --_Standard drawing , additional d
rawing --schedule and specification

- power systems voltage ,

Voltage classified

- income service Volta,income consider

- type of system:

Power system analyse ,short current wave.

- fault current calculat, fault calculai for specifications,medium voltage ,breaker fault ,molded circuit breaker , int

Grounding ground fault ,

- typicK power systt generator and generator system ,generator short circuit ,caractt,generator set size ,rating ,g

- typical applicatt ,health facilities ,quickly generator and load bank ,power quality,

- power quality seism ,ampacities for conductor ,NPA 70-2014,

- safety goal power hazard oashs , NEC

- regulation requ
& Maximum flexibility ,minimum
- maximizing electrical minimy operating : loss conductor transfory .
: discussed further ,
- development phase : input plumbing construction v.
- construcy documents : project ..

Experiemental orientation guide workbase Manuel construction guidelines:
- electrical engineering
Electrician
Design. ,,
Z×A×U= .
ΔU.2L××Pxz×Z×A

..**schema electrical / drawing design
 panel
_____&
- electrical power effect dynamic between 2 conduct ,3 conductor parallel , consumer power AC ,DC
Courent I1,I 2..
S= porter in cm ,a = distance in cm ,,
P= U× I.[W].IP.U
P=U×I×cos .flux ..IP × U× cos alph .
P= 3×I×I×cos [W] IP×3×U×cos flux
F2, 0,2×I@×2×s,a
=.....(N)
F3=0,808×F2[N]
F3=0,865×F2[N]
F3=0,865×F2[N]
-resistancd of conductor,L= ligth of conductor ,m aluminy,
- Z = conductivity, m /mm ion ,
A = across area conductor ,mm Sq..
- resistance = of coiling of induction condensator , L = inductance ,H ,f = frequency ,Hz ,,C = capacity ,f v= angle p
- series parallel installation ,
U=I×R[V].I.U..R=, R.I..ohmm × 33 m ,ohm m× 8,3 mm Sq × ohm
XL= 2×π×f×L, XC ,,2× π×f×c
{
=
ZR2(XL-XC)2=+ZR,,cos = --- ohm

RG, R1R2/R1+R2=..

R1R2×R×./ ..

Z..Z.@..Z2..=, X..X..

1***4.1.2.5***1..Cable and conductor : value short circuit current ,,assignment current ,,

Transformation

- system design of cable conductor:

Cable PVC,0,75 mm , souple,H05V - K ,0,75 black ,,big cable coutchouc ,3 conductor = 2,5 mm ,,

- protection , green yellow , symbol h ,supply voltage ,300/ 300v,03,,$00/500,450/750v

Material insulation cable : caoutchouc naturej styrene ,butadiene silicon material,PVC ,styrene tressfibre

- construction specialist cable : meplat with conductor separe H,NHL ,,cable plastic gain ,cable concentric onduke

- characteristics of materials : polythylene ,elastic ,thermoplastic ,color ,grid degree Up ,stabilt chemit,alcol verni

Fuse motor tree phase value rotor squire ,(DIN VDE 0636,,

Control thermic ,,start delta over load max start ,2 × assignt current , max 5 sec ,, regulation 0,58,,

Switch ,switch gear ,,, close open circuit

Usage current ,

I = courent etablid ,IC = courent coupe,I e = courant assigned d employ ,u tension avant fermeture ,u r = tension motor starting b,,power cut open close ,L/Rv,ms. Break current .

Letter and Laball switch USA ..

S ,switcy combination lock non lokkin, disconnect switch ,drum switch ,flow operated switch ,foot operated swit mushroom head,pressure or vacut,operated switch,pushbuy or vacut, pushbuy swity,pushilluminates ,rotary swi switch ,toggle switch transfer switch ,wobble stick , fuel contactor ,relay blowotbreak coil field ,commutating fiel

Connector,,

- Consol visual ,prodibus , can bopen ethernet commuyaty ,net pin 1, pin

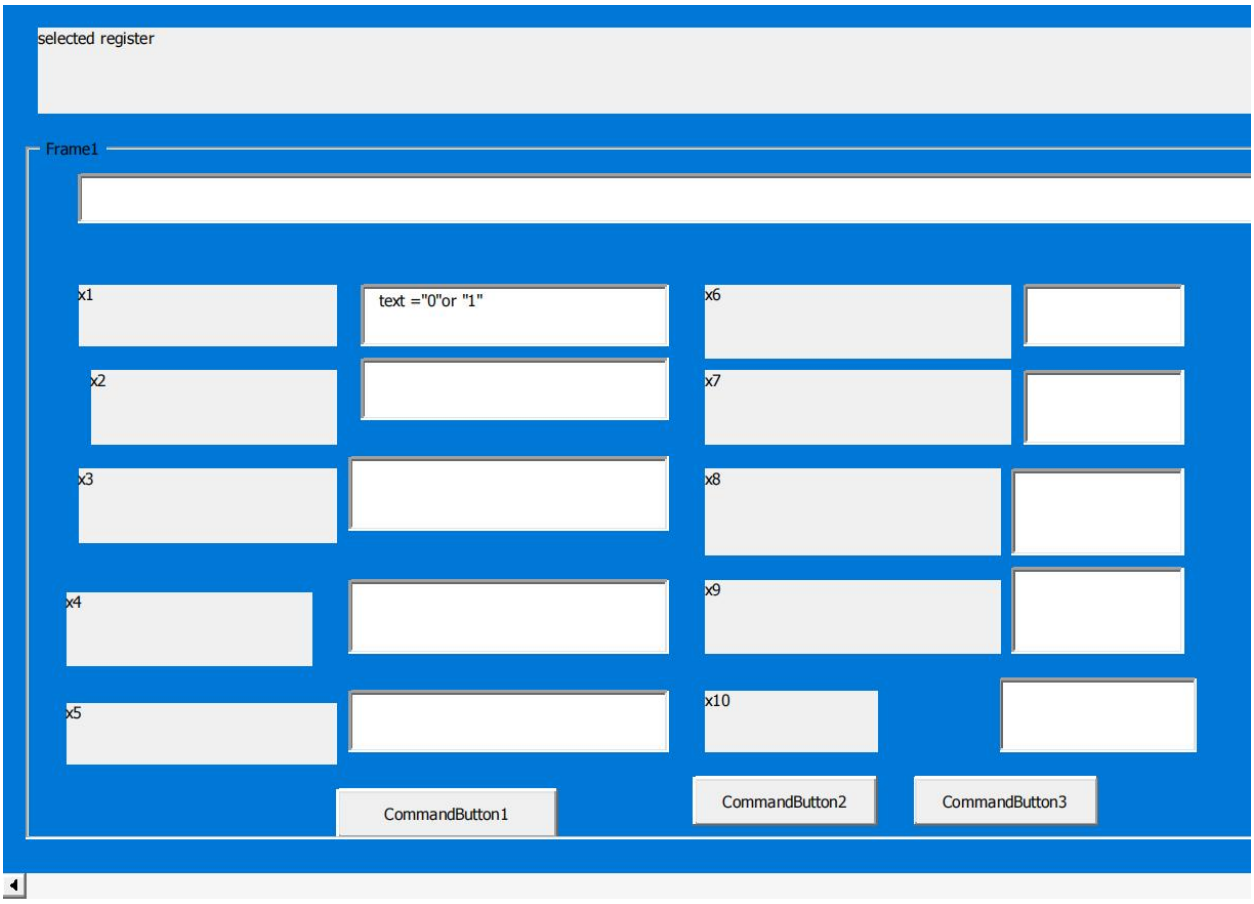
Atex , installation

Command automatics

Installatt port ethernet ,port ethernet prise RJ45,led ,port com

Synopsis cabling system

Logigrame algorithm ,commutator.

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Sub Macro1()
'
' Macro1 Macro
```

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' visual basic atm program .sten object by system .event )hand
' "&chr(10)&"public class transaction box
' "&chr(10)&"const service as decimal =6.5
' "&chr(10)&"const pin as integer +9343
' "&chr(10)&"dim balance as decimal =150
' "&chr(10)&"private sub label 12_click (by sender System.object event arg handles labe
'
End Sub
Sub Macro2()
'
' Macro2 Macro
' type meter three phase ac static watt hous smart
' "&chr(10)&"metering algorith
' "&chr(10)&"accuracy  nomial voltage  mettering frequence metering const functionality current sensors energy pulse energy temper detection remote communication iec 62056 extrevm internal battery
'
    ActiveWindow.ActivePane.VerticalPercentScrolled = 205
    ActiveWindow.ActivePane.VerticalPercentScrolled = 146
    Selection.TypeText Text:= _
        "------------------------------------------------------------"
    Selection.TypeText Text:= _
        "------------------------------------------------------------"
    Selection.TypeText Text:="-------"
    Selection.TypeParagraph
    Selection.PasteAndFormat (wdFormatOriginalFormatting)
    ActiveWindow.ActivePane.VerticalPercentScrolled = 146
    Selection.TypeParagraph
    Selection.TypeParagraph
    Selection.TypeParagraph
```

Selection.TypeParagraph

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Selection.TypeParagraph

Selection.Paste

ActiveDocument.Save

ActiveWindow.ActivePane.VerticalPercentScrolled = 207

ActiveWindow.ActivePane.VerticalPercentScrolled = 202

ActiveWindow.ActivePane.VerticalPercentScrolled = 197

ActiveWindow.ActivePane.LargeScroll Down:=1

ActiveWindow.ActivePane.VerticalPercentScrolled = -75

```
    ActiveWindow.ActivePane.VerticalPercentScrolled = -41
    Windows("Doc8 drawing tshingombe fiston").Activate
    Windows("Doc2 drawing tshingombe").Activate
    ActiveWindow.ActivePane.VerticalPercentScrolled = 127
    ActiveWindow.Close
    ActiveWindow.Close
    ActiveWindow.Close
    ActiveWindow.Close
    ActiveWindow.Close
    ChangeFileOpenDirectory "C:\Users\Library SIX\Desktop\"
    ActiveDocument.SaveAs2 FileName:="Doc1 tshing.docx", FileFormat:= _
        wdFormatXMLDocument, LockComments:=False, Password:="", AddToRecentFiles _
        :=True, WritePassword:="", ReadOnlyRecommended:=False, EmbedTrueTypeFonts _
        :=False, SaveNativePictureFormat:=False, SaveFormsData:=False, _
        SaveAsAOCELetter:=False, CompatibilityMode:=15
    ActiveWindow.Close
    Application.Quit
End Sub
Sub Macro3()
'
' Macro3 Macro
' register computer  select  pin input out put
' "&chr(10)&"binaire code adress x1,x2,x3,x4,x5,x6,x7,
'
    Application.Run MacroName:="frm1"
End Sub
Sub frm1()
'
' frm1 Macro
```

' if x1,x2,x3,x4 ,x5,x6,x7,x8,x9 then register else select ,,, end if select case x1 and select x2 and iteractive execute loop for each while the statemnt " if x1 then" x2 or" sub " block statemnt ,, arrays paraenthes declare , create consol mod

'

End Sub

```
VERSION 5.00
Begin {C62A69F0-16DC-11CE-9E98-00AA00574A4F} UserForm12
   Caption         =   "UserForm12"
   ClientHeight    =   8736
   ClientLeft      =   108
   ClientTop       =   456
   ClientWidth     =   19764
   OleObjectBlob   =   "UserForm computer x 1 tshingombe.frx":0000
   StartUpPosition =   1  'CenterOwner
   WhatsThisButton =   -1  'True
   WhatsThisHelp   =   -1  'True
End
Attribute VB_Name = "UserForm12"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
```

1 .12.15..1 topics :

1 AGI in Human-Machine Collaboration

Exploring how AGI can augment human capabilities and lead to new forms of collaboration.

Future Scenarios of AGI Development

Examining possible future scenarios

7topics :

4.1 .12.15.7.1.Masters in Vertical Farming and Urban Agriculture with Focus on Synthetic Biology

This course explores the intersection of vertical farming, urban agriculture, and synthetic biology, preparing students to implement urban farming systems that leverage synthetic biology for enhanced productivity and sustainability.

7.2Introduction to Vertical Farming and Urban Agriculture

An overview of vertical farming and urban agriculture, their roles in modern food production, and how they contribute
how they contribute to sustainability.

Key Topics:

- **Definitions and Concepts:** Understanding what vertical farming and urban agriculture entail.
- **Historical Development:** Tracing the evolution of these farming techniques.
- **Sustainability Contributions:** How these methods reduce the carbon footprint and promote resource effi

7.3.Fundamentals of Synthetic Biology

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are

Study the basic principles of synthetic biology, including DNA sequencing, genetic engineering, and how these tools are

Key Topics:

- **Introduction to Synthetic Biology:** Basic concepts and terminology.
- **DNA Sequencing and Genetic Engineering:** Techniques and applications.
- **Plant Optimization:** How synthetic biology enhances plant growth and resilience

7.4..Applications of Synthetic Biology in Urban Agriculture

Explore how synthetic biology is revolutionizing urban farming, including genetically modified organisms and engineere

7.6Design of Vertical Farming Systems

Learn the architectural and systems design principles for creating efficient vertical farms in urban environments.: Explo
engineered biosystems that improve crop yield.

Key Topics:

- **GMOs in Urban Farming:** Benefits and challenges.
- **Engineered Biosystems:** Innovations that enhance productivity and sustainability.
- **Case Studies:** Examples of successful applications in urban agriculture.

7.7Integration of Biotechnology in Crop Production

Discuss the integration of biotechnology tools to enhance crop resilience, nutrient uptake, and pest resistance.: Explore

Key Topics:

- **Innovative Technologies:** Emerging tools and techniques.
- **Sustainability Goals:** Advancing towards more sustainable and resilient food systems.
- **Research and Development:** Ongoing projects and future research directions.

These courses will provide students with a comprehensive understanding of the intersection between vertical farming, production.

Feel free to ask if you need more details or specific information on any of these topics!

7.8.Environmental and Economic Impacts of Urban Agriculture

Evaluate the environmental and economic benefits and challenges posed by urban agriculture and vertical farming.

7.9.Regulatory and Ethical Considerations in Synthetic Biology

Examine the regulatory frameworks and ethical considerations associated with the use of synthetic biology in agricultu globally

7.10Future Trends in Vertical Farming and Synthetic Biology

Explore the potential future advancements in vertical farming technologies and synthetic biology app· · **Equity and Acc**

8..topic

4.1 .12.15..8.Master's in Urban Water Supply, Sewerage, Waste Management, and Remediation Activities

8.1. This course delves into the complexities of urban infrastructure related to water supply, sewerage, waste manager effective urban planning necessary to manage these essential services sustainably. The course equips graduates with th sectors.

8.2.Introduction to Urban Water Supply Systems

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality

Explore the components of urban water supply systems, including water sourcing, treatment, distribution, and quality m

Key Topics:

- **Water Sourcing:** Identifying and managing sources of water such as rivers, lakes, and groundwater.
- **Water Treatment:** Processes for purifying water to meet safety and quality standards.
- **Distribution Systems:** Designing and maintaining networks for efficient water delivery.
- **Quality Management:** Monitoring and ensuring the quality of water supplied to urban areas.

8.3 Sewerage Systems Design and Manage

8.3.Sewerage Systems Design and Management

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable

Learn about the engineering, design, and operational management of urban sewerage systems, focusing on sustainable

Key Topics:

- **Engineering Principles:** Understanding the fundamentals of sewerage system design.
- **Sustainable Practices:** Implementing environmentally friendly waste treatment methods.
- **Resource Recovery:** Techniques for reclaiming and repurposing resources from was

8.4.Urban Waste Management Strategies

Understand the principles and methods of waste management in urban areas, addressing : Understand the principles a and liquid waste effectively.

Key Topics:

- **Waste Collection and Disposal:** Strategies for efficient waste collection, segregation, and disposal.
- **Recycling and Reuse:** Promoting recycling and reuse to minimize waste generation.
- **Waste Reduction:** Implementing programs and policies to reduce overall waste output.

8.5.Remediation Activities and Technologies

Explore different technologies and methodologies used in the remediation of contaminated sites, focusing on both che into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and rem

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.6.Policy and Regulation in Urban Water and Waste

Gain insights into the regulatory frameworks and policies that govern urban water and waste management. Explore ho and waste management into urban planning processes to create more sustainable and livable cities.

Key Topics:

- **Urban Planning Principles:** Incorporating water and waste considerations into urban design.
- **Interdisciplinary Approaches:** Collaborating with various stakeholders for holistic planning.
- **Sustainable Development Goals:** Aligning urban planning with global sustainability objectives.

These courses provide a comprehensive understanding of urban water supply, sewerage, waste management, and rem

If you need more details or have specific questions on any of these topics, feel free to let me know!

8.7.Climate Change and its Impact on Water and Waste Management

Examine how climate change affects urban water and waste systems and explore adaptive strategies to enhance resilie

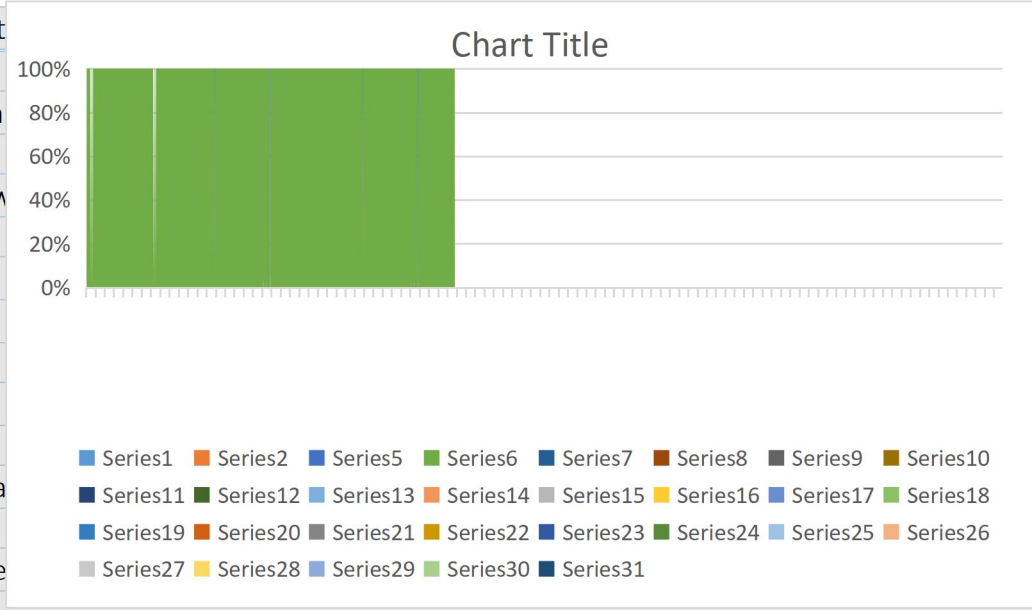
8.8..Sustainable Innovations in Water and Waste Systems

Discover emerging technologies and innovative practices for enhancing sustainability in urban water and waste manage emerging technologies and innovative practices. Here are some cutting-edge innovations:

Emerging Technologies:

1. **Smart Water Management Systems**
    - Utilize IoT sensors and real-time data analytics to monitor water quality, detect leaks, and optim
    - Implement smart meters to provide accurate water consumption data and encourage conservat
2. **Advanced Water Treatment Technologies**
    - Adopt membrane filtration, advanced oxidation processes, and nanotechnology to enhance wat
1. Use desalination technologies to convert seawater into **aste-to-Energy Technologies**
    - Convert organic waste into biogas through anaerobic digestion, reducing landfill waste and gene
    - Implement gasification and pyrolysis to transform solid waste into syngas and biochar.
2. **Decentralized Wastewater Treatment**
    - Develop decentralized systems that treat wastewater close to the source, reducing the need for
    - Use constructed wetlands and natural treatment systems for cost-effective and sustainable was

3. **Green Infrast**



- Integrate green
- Employ urban w

Innovative Practices:

-

1. 8.9Integrating Water a
    - Adopt integrate
    - Use spatial planning tools to optimize the placement of water and waste facilities, minimizing en
2. **Sustainable Development Goals (SDGs)**

- Align urban planning efforts with the United Nations Sustainable Development Goals, particular
- Promote sustainable land use practices that protect water resources and reduce waste generati

3. Interdisciplinary Collaboration
   - Foster collaboration among urban planners, engineers, environmental scientists, and policymak
   - Engage stakeholders, including local communities, businesses, and NGOs, in the planning proces
4. Climate Resilience and Adaptation
   - Incorporate climate resilience measures into urban planning to address the impacts of climate c
   - Develop adaptive strategies to manage extreme weather events, such as floods and droughts, a
5. Green and Blue Infrastructure Integration
   - Integrate green infrastructure (e.g., parks, green roofs) and blue infrastructure (e.g., rivers, lake
   - Design urban spaces that promote natural water infiltration, reduce runoff, and support biodive
6. Data-Driven Decision Making
   - Utilize Geographic Information Systems (GIS), remote sensing, and data analytics to inform plan
   - Implement smart city technologies to enhance the management and operation of water and wa

By adopting these strategies and embracing innovative technologies, urban planners can create more sustainable, resil

If you have any specific questions or need more detailed information on any of these topics, feel free to ask!

Learn how to effectively integrate water supply, sewerage, and waste management into urban planning processes to cr

9.topic

4.1 .12.15..9.1.Transportation and Warehousing in Tourism Planning and Development

This course offers a comprehensive study into how transportation and warehousing play a crucial role in tourism plann
optimize tourism supply chains, improve accessibility, and enhance the overall tourist experience. This course provides

development.

9.2..Introduction to Tourism Logistics

Explores the fundamental principles of logistics management within the tourism sector, emphasizing its role in seamles

- **Air Travel:** Managing airport logistics, flight scheduling, and passenger services.
- **Rail and Road Transport:** Coordinating bus and rail services for tourists, ensuring efficient transit systems
- **Maritime Travel:** Organizing ferry and cruise services, port management.

· **Warehousing Solutions**

- **Storage Facilities:** Designing and managing warehouses for tourism-related goods.
- **Inventory Management:** Techniques for maintaining op

9.3...Transportation Infrastructure in Tourism

Examines the various transportation infrastructures such as airports, seaports, and road networks that support the tou

- **Regulatory Compliance:** Understanding laws and regulations affecting transportation and warehousing in
- **Sustainability Policies:** Implementing eco-friendly practices to minimize environmental impact.

9.4..Role of Warehousing in Tourism

Discusses how warehousing and inventory management contribute to the efficiency of tourism operations. **ogistics and**

- **Supply Chain Management:** Strategies for efficient coordination of suppliers, transporters, and retailers.
- **Infrastructure Development:** Planning and constructing facilities to support tourism activities.
- **Technology Integration:** Using digital tools for tracking, scheduling, and management.

9.5..Sustainable Transport Solutions

Covers sustainable practices and innovations in transportation that minimize environmental impact and promote eco-f

- **Barrier-Free Travel:** Designing inclusive transportation systems for travelers with disabilities.
- **Connectivity Enhancement:** Ensuring seamless transitions between different modes of transport.

9.6..Tourism Supply Chain Management

Analyzes the intricacies of supply chain management specifically in the tourism sector, including challenges and best pr

- **Definition and Scope:** Understanding what tourism logistics encompasses.
- **Key Components:** Identifying the main elements of tourism logistics, such as transportation, warehousing

· **Role in Seamless Travel Experiences**

- **Customer Satisfaction:** Ensuring tourists have smooth and enjoyable experiences from arrival to departu
- **Efficiency and Reliability:** Improving the efficiency and reliability of travel services through effective logist

9.7.Policy and Regulations in Tourism Transport

Explores the regulations and policies affecting transportation and warehousing, and how they influence tourism develo

- **Seasonal Demand:** Managing fluctuations in demand due to tourist seasons.
- **Coordination Complexity:** Overcoming challenges in coordinating multiple service providers and stakehol

· **Technological Advancements**

- **Digital Solutions:** Utilizing technology to streamline logistics processes, such as online booking systems a
- **Data Analytics:** Leveraging data to predict trends, optimize routes, and improve service delivery.

9.8.Innovations in Tourism Warehousing

Investigates recent technological advancements in warehousing that support tourism industry needs. 9.8 Innovations i

This section investigates recent technological advancements in warehousing that support the tourism industry's needs.

Technological Advancements:

1. **Smart Warehousing:** Automation and AI-driven inventory management systems optimize workflows an

9.9..Case Studies on Tourism and Logistics

Presents case studies highlighting logistics success and challenges in various tourism destinations. his section presents

Case Studies:

1. **Public Policy Co-Creation in Recife:** Examines the creative tourism plan development process in Recife,

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10.topics

4.1 .12.15.10.1..Spatial Computing in Telecommunications

This course explores the integration of spatial computing technologies within the telecommunications sector. Students and innovate telecommunications solutions. Covering foundational concepts to advanced applications, the course is de

10.2..Introduction to Spatial Computing

This topic covers the basics of spatial computing, its historical evolution, and its current importance across various indu

1. **Foundational Concepts**
    - **Spatial Data:** Understanding the types of spatial data, including geographic information systems
    - **Spatial Computing Principles:** Basic principles of spatial computing, including spatial analysis, da
2. **Network Efficiencies**
    - **Optimizing Network Design:** Utilizing spatial data to design more efficient and reliable telecomm

10.3..Spatial Data and Telecommunications

An exploration of the types and sources of spatial data utilized in telecommunications, as well as methods for data c

Resource Allocation: Applying spatial analysis to optimize the allocation of network resources and infrastru

· **Service Delivery Improvements**

Location-Based Services: Enhancing service delivery through the integration of location-based services and personali

Coverage Mapping: Using spatial data to identify coverage gaps and optimize network coverage.

10.4..Geographical Information Systems (GIS) in Telecom

This topic discusses the application of GIS technologies for network planning, resource optimization, and service provis

- **Smart Cities:** Leveraging spatial computing to develop smart city solutions that integrate telecommunicat
- **Augmented Reality (AR) and Virtual Reality (VR):** Exploring the applications of AR and VR in telecommuni

10.5..Network Planning and Optimization Using Spatial Computing

Strategies for using spatial computing to optimize telecom network deployments and enhancements through simulatio

10.6.Spatial Data Analytics for Telecom

An examination of analytic techniques and algorithms that leverage spatial data to provide insights and performance in

- **5G and Beyond:** Investigating the role of spatial computing in the deployment and optimization of 5G ne
- **Predictive Analytics:** Using spatial data for predictive analytics to anticipate network demands and preve

10.7..Augmented Reality (AR) in Telecommunication Services

Understanding the role of AR technologies in enhancing customer experiences and operational efficiencies within telec
across various industries, with a particular focus on telecommunications.

Key Topics:

1. **Basics of Spatial Computing**
    - **Definition and Scope:** Understanding what spatial computing entails and its applications.
    - **Key Components:** Identifying the main elements of spatial computing, such as spatial data, geos
2. **Historical Evolution**
    - **Early Developments:** Tracing the origins of spatial computing from early cartography and geogra
    - **Technological Advancements:** Highlighting key technological advancements that have shaped th

10.11..5G and Spatial Computing

1. Investigating how 5G technology benefits from spatial computing, including precise location services ar

    - **Cross-Industry Applications:** Exploring how spatial computing is used in various industries, includ

    - **Focus on Telecommunications:** Examining the specific applications of spatial computing in telec

These courses provide students with a comprehensive understanding of spatial computing and its transformative impa

If you have any specific questions or need more details on a

10.12..Privacy and Security in Spatial Telecommunications

A look into the potential security and privacy challenges posed by spatial data in telecommunications and strate,

Key Challenges:

1. **Data Privacy Concerns**: The extensive collection and transmission of spatial data can lead to unauthoriz

---

11..topics

4.1 .12.15..11.1..Advanced Legal Studies in Public Administration and Safety

This course is designed for Master's level students pursuing a degree in Public Administration and Safety with a focus o principles that underpin public administration and safety mechanisms. The course covers a range of topics, from consti navigate the complex legal landscape within the public sector.

11.2Introduction to Public Law

An overview of the principles and functions of public law, including constitutional and administrative law, which regulat

An overview of the principles and functions of public law, including constitutional and administrative law, which regulat

Key Topics:

- **Principles of Public Law:** Understanding the foundational concepts of public law.

- **Constitutional Law:** Examining the structure and functions of the constitution in regulating state authorit

- **Administrative Law:** Exploring the rules that govern the actions of administrative agencies.

11.3.Constitutional Law and Governance

Exploration of constitutional principles and how they guide governance and the formation of public policies. Exploratio

Key Topics:

- **Constitutional Principles:** Understanding fundamental principles like the rule of law, separation of power
- **Governance:** Analyzing how constitutional principles influence the design and functioning of government
- **Public Policy Formation:** Examining the role of constitutional law in shaping public policies.

11.4.Administrative Law

Understanding the rules and regulations that govern the activities of administrative agencies of government. Understar

Key Topics:

- **Administrative Agencies:** Exploring the creation, powers, and functions of administrative agencies.
- **Regulatory Frameworks:** Understanding the legal frameworks that regulate administrative actions.
- **Judicial Review:** Examining the mechanisms for reviewing administrative decisions

11.5.Legal Frameworks for Public Safety

Examination of the legal structures and policies designed to protect public safety and maintain order.

11.6..Ethics in Public Administration

Study of ethical principles and how they apply to decision-making processes in public administration. Examination of th

Key Topics:

- **Public Safety Laws:** Analyzing laws and regulations aimed at protecting public safety.
- **Policy Development:** Understanding the process of developing and implementing public safety policies.
- **Enforcement Mechanisms:** Exploring the role of law enforcement agencies in maintaining public order.

11.7..Public Policy and Legal Implications

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation. Study of et

Key Topics:

- **Ethical Theories:** Understanding various ethical theories and their application in public administration.
- **Decision-Making:** Examining ethical considerations in decision-making processes.
- **Accountability:** Exploring mechanisms for ensuring ethical conduct and accountability in public administr

Analysis of the intersection of law and public policy and the impact of legal frameworks on policy formation.

Key Topics:

- **Law and Policy:** Understanding the relationship between legal frameworks and public policy.
- **Policy Analysis:** Examining the legal implications of policy decisions.
- **Case Studies:** Analyzing real-world examples of law influencing public policy

11.8..Human Rights and Social Justice

Understanding the role of law in promoting human rights and social justice in public administration. Understanding the

Key Topics:

- **Human Rights Law:** Exploring international and domestic human rights frameworks.
- **Social Justice:** Examining the role of law in addressing social inequalities and promoting justice.
- **Advocacy:** Understanding the

11.9.Crisis Management and Legal Compliance

Strategies for managing crises in public administration while ensuring compliance with legal standards. Strategies for m

Key Topics:

- **Crisis Management:** Developing strategies for effectively managing crises in public administration.
- **Legal Compliance:** Ensuring adherence to legal frameworks during crisis situations.
- **Contingency Planning:** Creating plans for maintaining public safety and order during emergencies.

These courses provide students with a comprehensive understanding of the legal aspects of public administration and

If you have any specific questions or need more details on any of these topics, feel free t

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12.topic

4.1 .12.15..12.1Metallurgy in Oil and Gas Production, Refining, and Transport

This course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas i
industry, focusing on their application in production, refining, and transport operations. The course aims to develop a c

12.2..Introduction to Metallurgy in Oil and Gas

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and ar

his course provides an in-depth understanding of the metallurgical principles and practices specific to the oil and gas in
industry, focusing on their application in production, refining, and transport operations. The course aims to develop a c

12.3..Material Selection for Oil and Gas Production

Examines criteria for selecting materials, focusing on mechanical properties and corrosion resistance required in produ

An overview of the role of metallurgy in the oil and gas industry, discussing the importance of material selection and ar

Key Topics:

- **Role of Metallurgy:** Understanding the critical importance of metallurgy in oil and gas operations.
- **Material Selection:** Factors influencing the selection of materials for different segments of the industry.
- **Common Challenges:** Identifying and addressing common metallurgical issues, such as corrosion and mat

12.4..Corrosion Mechanisms and Prevention

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress
mechanical properties and corrosion resistance required in production environments.

Key Topics:

- **Mechanical Properties:** Evaluating the strength, toughness, and durability of materials.
- **Corrosion Resistance:** Understanding the importance of corrosion resistance in harsh environments.

- **Material Criteria:** Criteria for selecting suitable materials for production equipment and infrastructure.

12.5..Metallurgical Processes in Refining

Discusses how metallurgical processes like heat treatment and welding are utilized in refining operations to enhance m

Explores common corrosion mechanisms in oil and gas environments, such as sulfide stress cracking and chloride stress

Key Topics:

- **Corrosion Mechanisms:** Understanding different types of corrosion and their causes.
- **Sulfide Stress Cracking:** Examining how sulfide stress cracking occurs and how to prevent it.
- **Chloride Stress Corrosion:** Exploring the effects of chloride stress corrosion and prevention methods.

12.6..Pipeline Materials and Design

Addresses the materials and design considerations for constructing oil and gas pipelines, including the assessment of fa utilized in refining operations to enhance material properties.

Key Topics:

- **Heat Treatment:** Techniques for enhancing the mechanical properties of metals through heat treatment.
- **Welding:** Best practices for welding in refining operations.
- **Material Enhancement:** Methods for improving the performance and longevity of materials used in refini

12.7.Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry assessment of failure modes and maintenance practices.

Key Topics:

- **Material Selection for Pipelines:** Criteria for selecting materials for pipeline construction.
- **Pipeline Design:** Principles of pipeline design to ensure safety and reliability.
- **Failure Modes:** Identifying common failure modes and strategies for prevention.

- **Maintenance Practices:** Best practices for maintaining pipeline integrity

Advanced Coatings and Surface Treatments

Focuses on the application of advanced coatings and surface treatments to protect metals used in oil and gas industry

Key Topics:

- **Coating Technologies:** Exploring different types of coatings and their applications.
- **Surface Treatments:** Techniques for treating metal surfaces to enhance durability and resistance to corro
- **Protective Measures:** Implementing protective measures to extend the lifespan of equipment.

12.8.Environmental Impact and Sustainability in Metallurgy

Evaluates the environmental impact of metallurgical practices in the oil and gas industry and explores sustainable pract explores sustainable practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.
- **Innovations:** Exploring technological innovations for reducing environmental imp

12.9..Failure Analysis and Case Studies

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies. Eva practices and innovations.

Key Topics:

- **Environmental Impact:** Assessing the environmental consequences of metallurgical activities.
- **Sustainable Practices:** Implementing eco-friendly practices in metallurgy.
- **Innovations:** Exploring technological innovations for reducing environmental imp

Explores methods for conducting failure analysis on metallurgical components and reviews real-world case studies.

Key Topics:

- **Failure Analysis Techniques:** Methods for analyzing and diagnosing material failures.
- **Case Studies:** Reviewing real-world examples of metallurgical failures and the lessons learned.
- **Preventive Measures:** Developing strategies to prevent future failur

12.10Future Trends in Metallurgy for Oil and Gas

Discusses emerging trends and technological advancements in metallurgy that could shape the future of the oil and gas
the oil and gas industry.

Key Topics:

- **Emerging Technologies:** Exploring new technologies and their potential impact on metallurgy.
- **Industry Trends:** Identifying trends that are likely to influence the future of metallurgy in the oil and gas s
- **Research and Development:** Current and future research initiatives aimed at advancing metallurgical pra

These courses provide a comprehensive understanding of metallurgical principles and practices tailored to the oil and g
field.

If you need more details or specific information on any of these topics, feel fr

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13.Topics:

4.1 .12.15..13.1.Integrated Water Management in Mining

This course provides an in-depth analysis of integrated water management practices within the mining industry. It cove
and societal needs. The course examines technological advances, regulatory frameworks, and case studies, aimed at ec

13.2.Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significan

13.2.Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies.

13.3.Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollut

13.4.Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance st

13.5.Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water re

13.6.Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strate

13.7..Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptatio

13.8.Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and be

13.7.Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

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13.2 Introduction to Mining Water Management

Overview of water use in mining operations, including extraction, processing, and remediation. Discusses the significan

Key Topics:

- **Water Use in Mining:** Understanding the various stages of water use in mining operations, from extractio
- **Integrated Water Management:** The importance of a holistic approach to managing water resources sust
- **Significance in Sustainable Mining:** How integrated water management contributes to sustainable mining

13.3 Water Resource Evaluation and Planning

Methods for evaluating water resources at mining sites, including hydrological assessments and water balance studies.

Key Topics:

- **Hydrological Assessments:** Techniques for assessing the availability and quality of water resources at min
- **Water Balance Studies:** Understanding the inputs and outputs of water within mining operations.
- **Planning Frameworks:** Developing comprehensive plans for sustainable water management.

13.4 Water Quality Management in Mining

Techniques for monitoring and managing water quality in mining contexts, including treatment technologies and pollut

Key Topics:

- **Water Quality Monitoring:** Methods for regularly assessing water quality.
- **Treatment Technologies:** Exploring technologies for treating contaminated water in mining operations.
- **Pollution Control:** Strategies for preventing and controlling pollution in mining environments.

13.5 Regulatory and Environmental Compliance

An overview of legal frameworks and environmental regulations affecting water use in mining. Discusses compliance st

Key Topics:

- **Legal Frameworks:** Understanding the regulations governing water use in mining.
- **Environmental Compliance:** Ensuring mining operations adhere to environmental standards.
- **Reporting Requirements:** Developing strategies for meeting regulatory reporting obligations.

13.6 Innovation and Technology in Water Management

Examination of advanced technologies and innovative approaches in water management, such as desalination, water re

Key Topics:

- **Desalination:** Using desalination technology to provide fresh water for mining operations.
- **Water Recycling:** Implementing recycling systems to reduce water consumption.
- **Smart Water Systems:** Leveraging digital technologies to optimize water management.

13.7 Stakeholder Engagement and Social License

The importance of engaging with stakeholders and communities regarding water management in mining. Covers strate

Key Topics:

- **Stakeholder Engagement:** Techniques for effectively engaging with stakeholders.
- **Community Involvement:** Involving local communities in water management decisions.
- **Social License to Operate:** Building and maintaining trust with stakeholders.

13.8 Climate Change Impacts on Water Resources

Analyzes the effects of climate change on water availability and management in mining operations. Discusses adaptatio

Key Topics:

- **Climate Change Effects:** Understanding how climate change impacts water resources in mining.
- **Adaptation Strategies:** Developing strategies to adapt to changing water availability.
- **Risk Minimization:** Implementing measures to minimize risks associated with climate change.

13.9 Case Studies and Best Practices

Review of real-world examples of successful water management in mining operations. Discusses lessons learned and be

Key Topics:

- **Successful Case Studies:** Examining examples of effective water management in mining.
- **Lessons Learned:** Identifying key takeaways from real-world cases.
- **Best Practices:** Establishing best practices for water management in mining.

13.10 Future Trends in Mining Water Management

Explores anticipated future developments in water management technologies and policies in mining.

Key Topics:

- **Emerging Technologies:** Investigating new technologies for water management.
- **Policy Developments:** Understanding how policies may evolve to support sustainable water management
- **Future Directions:** Exploring potential future trends in water management for mining.

These courses provide a comprehensive understanding of integrated water management in the mining industry, equipp

If you need more details or specific information on any of these topics, feel free to ask!

14.topic

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Key Topics:

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If you need more details or specific information on any of these topics, feel free to ask!

15.topics

4.1 .12.15..15.1.Advanced Manufacturing Techniques in Genetic Engineering

This course explores the convergence of manufacturing processes and genetic engineering advancements, focusing on into techniques used to enhance manufacturing processes in biotechnology and genetic engineering fields.

15.2.Introduction to Genetic Engineering

Provides a foundational understanding of genetic engineering principles, techniques, and its application in various field

15.3..Manufacturing Processes in Biotechnology

Covers traditional and innovative manufacturing processes used in biotechnology, essential for producing genetically m

15.4..CRISPR and Advanced Genetic Modification Techniques

An in-depth look at cutting-edge genetic modification techniques such as CRISPR, which are revolutionizing genetic eng

15.5.Ethical and Regulatory Considerations

Discusses the ethical dilemmas and regulatory framework governing genetic engineering and manufacturing processes

15.6.Biopharmaceutical Manufacturing

Explores the manufacturing techniques specific to biopharmaceuticals produced through genetic engineering.

15.7.Fermentation Technology

Focuses on fermentation processes used in manufacturing biologically engineered products.

15.8..Scale-Up and Commercialization

Discusses the challenges and strategies involved in scaling genetic engineering products from laboratory to market.

15.9.Quality Control in Genetically Engineered Products

Examines the quality control methodologies specific to genetic engineering industries.

15.10.Future Trends in Genetic Engineering Manufacturing

Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufactur

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Provides a foundational understanding of genetic engineering principles, techniques, and its application in various field

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Looks ahead at emerging trends and technologies that are poised to influence the genetic engineering and manufactur

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16.topics

4.1 .12.15.16.1.Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such

16.2.Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

16.3.Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

16.4..Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

16.5Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access managem

16.6.Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

16.7Distributed Systems

Study of distributed computing systems architecture, design, and management.

16.8.Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

16.9..Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

4.1 .12.15..16.1 Data Processing and Hosting Services in Computer Engineering

This course is designed for graduate students pursuing a Master's degree in Computer Engineering with a focus on data and processing vast amounts of data, and the technological infrastructure in hosting services necessary to support such

16.2 Introduction to Data Processing

An overview of data processing concepts including data collection, cleaning, transformation, and storage.

Key Topics:

- **Data Collection:** Methods and tools for gathering data from various sources.
- **Data Cleaning:** Techniques for identifying and correcting errors in data sets.
- **Data Transformation:** Processes for converting data into a usable format.
- **Data Storage:** Solutions for storing large volumes of data efficiently.

16.3 Cloud Hosting Services

Understanding cloud hosting fundamentals including types of cloud services, deployment models, and scalability.

Key Topics:

- **Types of Cloud Services:** Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a
- **Deployment Models:** Public cloud, private cloud, and hybrid cloud.
- **Scalability:** Techniques for scaling cloud resources to meet demand.

16.4 Big Data Technologies

Exploring the tools and technologies used for processing and managing big data such as Hadoop and Spark.

Key Topics:

- **Hadoop:** Overview of the Hadoop ecosystem and its components.
- **Spark:** Understanding Apache Spark and its use in big data processing.
- **Big Data Frameworks:** Comparing different frameworks and their applications.

16.5 Data Security in Cloud Hosting

An in-depth look into data security practices in cloud hosting environments, including encryption and access managem

Key Topics:

- **Encryption:** Techniques for encrypting data at rest and in transit.
- **Access Management:** Strategies for managing user access and permissions.
- **Security Protocols:** Implementing security protocols to protect data in the cloud.

16.6 Containerization and Microservices

Understanding containerization technologies like Docker and Kubernetes and their role in hosting services.

Key Topics:

- **Docker:** Basics of Docker and containerization.
- **Kubernetes:** Orchestration of containerized applications using Kubernetes.
- **Microservices Architecture:** Designing applications using microservices for scalability and flexibility.

16.7 Distributed Systems

Study of distributed computing systems architecture, design, and management.

Key Topics:

- **Distributed Computing:** Principles and challenges of distributed systems.
- **System Architecture:** Designing and managing distributed system architectures.
- **Consistency and Fault Tolerance:** Ensuring consistency and reliability in distributed environments.

16.8 Data Warehousing and Analytics

Techniques and tools used to design data warehouses and leverage analytics for business intelligence.

Key Topics:

- **Data Warehousing:** Design and implementation of data warehouses.
- **ETL Processes:** Extract, Transform, Load processes for data warehousing.
- **Business Intelligence:** Leveraging analytics for decision-making and insights.

16.9 Serverless Computing

Exploration of serverless computing models and their application in data hosting services.

Key Topics:

- **Serverless Models:** Understanding Function as a Service (FaaS) and Backend as a Service (BaaS).
- **Benefits of Serverless:** Scalability, cost-efficiency, and simplified management.
- **Use Cases:** Real-world applications of serverless computing.

These topics provide a comprehensive understanding of data processing and hosting services in computer engineering,

If you have any specific questions or need more details on a

17.topics

4.1 .12.15..17.1.Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about th

world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital curr

17.2.Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditiona

17.2.Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

17.3.Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks

17.4..Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and man

17.5.Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

17.6.Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency

17.7.Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and

17.8.NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital owners

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17.1 Masters in Cryptocurrency and Blockchain Applications

This course provides an in-depth exploration of blockchain technology and digital currency. Students will learn about th
world applications. Emphasis will be placed on developing a practical understanding of blockchain software, digital curr

17.2 Introduction to Blockchain Technology

Learn the fundamentals of blockchain technology, including its history, key concepts, and how it differs from traditiona

Key Topics:

- **History of Blockchain:** Tracing the origins and evolution of blockchain technology.
- **Key Concepts:** Understanding blocks, chains, nodes, and consensus mechanisms.
- **Differences from Traditional Databases:** Comparing blockchain to centralized databases in terms of struc

17.3 Cryptocurrencies: An Overview

Understand the various types of cryptocurrencies, their functions, and the economics underlying digital currencies.

Key Topics:

- **Types of Cryptocurrencies:** Bitcoin, Ethereum, altcoins, and stablecoins.
- **Functions of Cryptocurrencies:** Medium of exchange, store of value, and investment asset.
- **Economics of Digital Currencies:** Supply, demand, market capitalization, and price volatility.

17.4 Blockchain Consensus Mechanisms

Explore how consensus mechanisms like Proof of Work, Proof of Stake, and others operate within blockchain networks

Key Topics:

- **Proof of Work (PoW):** Understanding the mining process, energy consumption, and security.
- **Proof of Stake (PoS):** Staking, validators, and energy efficiency.
- **Alternative Consensus Mechanisms:** Delegated Proof of Stake (DPoS), Practical Byzantine Fault Tolerance

17.5 Smart Contracts

Learn about smart contracts, their capabilities, use cases, and limitations. Understand how they are deployed and man

Key Topics:

- **Definition and Functionality:** What smart contracts are and how they work.
- **Use Cases:** Applications in finance, supply chain, real estate, and other industries.
- **Limitations:** Challenges such as scalability, security vulnerabilities, and legal considerations.

17.6 Decentralized Finance (DeFi)

Explore the growth of DeFi platforms and how they are revolutionizing traditional financial systems.

Key Topics:

- **Overview of DeFi:** Understanding the principles and goals of decentralized finance.
- **DeFi Platforms:** Popular platforms like Uniswap, Aave, and Compound.
- **Impact on Traditional Finance:** How DeFi is transforming lending, borrowing, trading, and asset managem

17.7 Blockchain in Supply Chain Management

Understand how blockchain technology is applied in supply chain management to enhance transparency and efficiency

Key Topics:

- **Transparency and Traceability:** How blockchain improves visibility and tracking in supply chains.
- **Efficiency Improvements:** Reducing fraud, errors, and delays in supply chain processes.
- **Case Studies:** Real-world examples of blockchain applications in supply chain management.

17.8 Regulation and Compliance in Blockchain

Study the regulatory landscape surrounding blockchain technology and cryptocurrencies, including the challenges and

Key Topics:

- **Regulatory Frameworks:** Understanding the legal regulations governing blockchain and cryptocurrencies.
- **Compliance Requirements:** Ensuring compliance with anti-money laundering (AML) and know your custo
- **Challenges and Opportunities:** Navigating the evolving regulatory environment and its impact on the bloc

17.9 NFTs and Digital Assets

Explore the world of Non-Fungible Tokens (NFTs), their creation, market dynamics, and how they impact digital owners

Key Topics:

- **Introduction to NFTs:** Understanding what NFTs are and how they work.
- **Market Dynamics:** Trends, marketplaces, and the economic aspects of NFTs.
- **Impact on Digital Ownership:** How NFTs are changing the landscape of digital art, collectibles, and intelle

These topics provide a comprehensive understanding of cryptocurrency and blockchain applications, equipping studen

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18 topic

4.1 .12.15.18.1.Advanced Cybersecurity in Bibliotechnology

This course explores the intersection of cybersecurity and bibliotechnology, focusing on protecting digital library syste specifically tailored for bibliotechnology, ensuring the safety and security of digital libraries and bibliographic database

18.2.Introduction to Cybersecurity in Bibliotechnology

An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

18.3Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital

18.4.Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

18.5.Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

18.6.Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

18.7.Digital Rights Management in Bibliotechnology

Understanding digital rights management and its role in protecting digital content in bibliotechnology.

18.8.Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network

18.9.Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

18..10Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and blockchain in enhancing cybersecurity in bibliotechnology.

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An overview of the basic principles of cybersecurity and their importance in the domain of bibliotechnology.

Key Topics:

- **Cybersecurity Principles:** Basic concepts of cybersecurity such as confidentiality, integrity, and availability
- **Importance in Bibliotechnology:** Understanding why cybersecurity is crucial for digital libraries and biblio
- **Common Cyber Threats:** Identifying typical cyber threats that can affect bibliotechnological systems.

18.3 Threats and Vulnerabilities in Digital Libraries

Understanding the common cybersecurity threats and vulnerabilities unique to digital libraries.

Key Topics:

- **Threat Landscape:** Overview of threats such as malware, phishing, and ransomware.
- **Vulnerabilities:** Identifying and assessing vulnerabilities specific to digital library systems.
- **Risk Assessment:** Techniques for evaluating and mitigating risks in digital libraries.

18.4 Data Privacy and Integrity in Bibliotechnology

Exploring techniques to ensure data privacy and maintain data integrity for library users and their digital interactions.

Key Topics:

- **Data Privacy Techniques:** Implementing privacy measures such as anonymization and encryption.
- **Data Integrity:** Ensuring that data remains accurate and unaltered through checksums and hashes.
- **User Data Protection:** Protecting sensitive information related to library users.

18.5 Implementing Security Policies for Digital Libraries

Developing and applying security policies and frameworks tailored for digital libraries to safeguard information assets.

Key Topics:

- **Policy Development:** Crafting comprehensive security policies for digital libraries.
- **Frameworks:** Utilizing existing security frameworks like ISO/IEC 27001.
- **Policy Enforcement:** Strategies for enforcing and maintaining security policies.

18.6 Access Control in Library Networks

Examining access control mechanisms to secure user authentication and authorization within library systems.

Key Topics:

- **Authentication Methods:** Techniques such as passwords, biometrics, and multi-factor authentication.
- **Authorization:** Ensuring proper access controls and role-based access within library networks.
- **Access Management Tools:** Using tools and software to manage access controls effectively.

18.7 Digital Rights Management in Bibliotechnology

Understanding digital rights management (DRM) and its role in protecting digital content in bibliotechnology.

Key Topics:

- **DRM Principles:** Basic concepts and purposes of DRM.
- **DRM Technologies:** Tools and technologies used for implementing DRM in digital libraries.
- **Content Protection:** Strategies for protecting digital content from unauthorized access and distribution.

18.8 Network Security Essentials for Digital Libraries

Learn the essentials of securing library networks, combating network-based threats, and implementing robust network

Key Topics:

- **Network Security Fundamentals:** Understanding firewalls, intrusion detection/prevention systems, and V
- **Network Threats:** Identifying and mitigating threats such as DDoS attacks and man-in-the-middle attacks
- **Security Measures:** Best practices for securing network infrastructure in digital libraries.

18.9 Incident Response and Recovery for Digital Libraries

Strategies for effectively responding to and recovering from cybersecurity incidents within digital library environments.

Key Topics:

- **Incident Response Planning:** Developing and implementing incident response plans.
- **Recovery Techniques:** Strategies for recovering data and services after a cybersecurity incident.
- **Post-Incident Analysis:** Conducting root cause analysis and improving security measures.

18.10 Emerging Cybersecurity Technologies in Bibliotechnology

Explore the role of emerging technologies like AI and other advanced tools in enhancing cybersecurity in bibliotechnolo

Key Topics:

- **AI in Cybersecurity:** Utilizing artificial intelligence for threat detection and response.
- **Blockchain Technology:** Applying blockchain for secure and transparent data management.
- **Future Trends:** Exploring future trends and advancements in cybersecurity technologies.

These courses provide a comprehensive understanding of advanced cybersecurity principles and practices in the conte

19 topics

4.1 .12.15..19.1.1Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distrib

19.2..Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edg

19.3.Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

19.4.IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

19.5.Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for ener

19.6Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategie

19.6.Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine lea

19.7.Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

19.8.Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

19.9.Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems

19.1 Edge Computing in Modern Power and Energy Systems

This course provides an in-depth exploration of edge computing technologies and their integration into modern power distribution, improve grid reliability, and enhance energy management. The course covers various topics such as distrib

19.2 Introduction to Edge Computing

An overview of edge computing and its significance in the modern power and energy sectors. It covers the basics of edg

Key Topics:

- **Edge Nodes:** Understanding the role of edge nodes in data processing.
- **Latency Reduction:** Techniques to reduce latency and improve response times.
- **System Efficiency:** Enhancing overall system efficiency through edge computing.

19.3 Distributed Computing in Energy Systems

Explores how distributed computing operates in energy systems to enhance performance, reliability, and efficiency.

Key Topics:

- **Distributed Computing Principles:** Basics of distributed computing and its application in energy systems.
- **Performance Enhancement:** Improving system performance through distributed computing.
- **Reliability and Efficiency:** Ensuring system reliability and operational efficiency.

19.4 IoT Applications in Power Systems

Discusses the role of IoT devices in modern power systems for data collection, analysis, and decision-making.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in power systems.
- **Data Collection and Analysis:** Leveraging IoT for real-time data collection and analysis.
- **Decision-Making:** Enhancing decision-making processes using IoT data.

19.5 Real-time Data Processing

Focuses on techniques for real-time data processing at the edge, including algorithms and architectures suited for ener

Key Topics:

- **Real-time Processing Techniques:** Algorithms and architectures for real-time data processing.
- **Edge Processing:** Advantages and challenges of processing data at the edge.
- **Application in Energy Systems:** Implementing real-time data processing in energy management.

19.6 Security and Privacy in Edge Computing

Examines the security challenges in edge computing environments and how they impact energy systems, with strategie

Key Topics:

- **Security Challenges:** Identifying security threats in edge computing environments.
- **Privacy Concerns:** Ensuring data privacy in distributed systems.
- **Mitigation Strategies:** Techniques for mitigating security and privacy risks.

19.7 Edge Analytics for Energy Management

Investigates the use of edge analytics for optimizing energy management through predictive analytics and machine lea

Key Topics:

- **Edge Analytics:** Understanding edge analytics and its benefits.
- **Predictive Analytics:** Using predictive analytics for proactive energy management.
- **Machine Learning:** Applying machine learning models to enhance energy efficiency.

19.8 Energy Efficiency Optimization

Covers strategies for improving energy efficiency through edge computing technologies and smart grids.

Key Topics:

- **Energy Optimization Techniques:** Methods for optimizing energy use.
- **Smart Grids:** Role of smart grids in energy efficiency.
- **Integration with Edge Computing:** How edge computing enhances energy optimization efforts.

19.9 Case Studies on Edge Computing in Energy

Presents real-world case studies to illustrate the deployment and impact of edge computing in energy systems.

Key Topics:

- **Case Studies:** Examples of successful edge computing implementations.
- **Deployment Challenges:** Overcoming challenges in deploying edge computing solutions.
- **Impact Assessment:** Evaluating the impact of edge computing on energy management.

19.10 Future Trends in Edge Computing for Energy Systems

Explores future developments and potential advancements in edge computing applicable to power and energy systems

Key Topics:

- **Emerging Technologies:** Future technologies that could shape edge computing.
- **Trends in Energy Systems:** Anticipating trends and advancements in energy management.
- **Research and Development:** Ongoing and future research initiatives in edge computing.

These courses provide a comprehensive understanding of edge computing in modern power and energy systems, equip energy management.

If you have any specific questions or need more details on any of these topics, feel free to ask!

Edge Computing for Modern Power and Energy Systems

This advanced course explores the role and integration of edge computing technologies in modern power and energy s efficiency, reliability, and sustainability in energy systems. Students will learn through theoretical insights and practical

Introduction to Edge Computing

Understanding the basic concepts and architecture of edge computing, its significance in reducing latency and improvir

Role of Edge Computing in Smart Grids

Exploring how edge computing supports smart grid operations including demand response, grid stability, and energy di

Edge Computing for Renewable Energy Integration

Analyzing the integration of renewable energy sources into power grids using edge computing to enhance efficiency an

Data Management and Security in Edge Computing

Understanding how data is managed and secured in edge computing systems, with a focus on the challenges and solut

Machine Learning Applications on the Edge

Investigating the applications of machine learning in edge devices to predict and optimize energy consumption and dist

Case Studies in Edge Computing for Energy Systems

Reviewing real-world case studies to understand the implementation and outcomes of edge computing in energy syste

Challenges and Future Trends

Discussing the current challenges faced by edge computing in energy systems and predicting future trends and technol

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20 topics

4.1 .12.15..20.1.Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Techn
design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignmen

20.2.Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional

20.3.Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of internet of things (IoT)

20.4Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical componer

20.5.CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

20.6.Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

20.7.Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

20.8.Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

20.9..Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studi

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20.1 Masters in Cyber-Physical Systems and Information Technology

This course provides an in-depth understanding of Cyber-Physical Systems (CPS) within the realm of Information Techn
design, and application of CPS in various sectors. Through a combination of theoretical studies and practical assignmen

20.2 Introduction to Cyber-Physical Systems

This topic covers the basics of CPS, including definitions, history, and key concepts that distinguish CPS from traditional

Key Topics:

- **Definitions:** Understanding what CPS are and how they operate.

- **History:** Tracing the development and evolution of CPS.

- **Key Concepts:** Exploring the unique attributes of CPS, such as real-time computing and system integratio

20.3 Architecture of CPS

Explore the architecture of CPS, focusing on sensors, actuators, control systems, and the role of the Internet of Things (

Key Topics:

- **Sensors and Actuators:** Understanding their roles and how they interact within CPS.

- **Control Systems:** Examining the mechanisms that manage and control physical processes.

- **IoT Integration:** The role of IoT in enhancing CPS functionality and connectivity.

20.4 Networking and Communication in CPS

Understand the communication protocols and networks that enable interaction between cyber and physical componer

Key Topics:

- **Communication Protocols:** Exploring various protocols used in CPS for data transmission.

- **Network Architecture:** Designing and managing networks to support CPS operations.

- **Data Exchange:** Ensuring efficient and secure data exchange between components.

20.5 CPS Security and Privacy

This topic delves into the security challenges in CPS and discusses methods to ensure data integrity and privacy.

Key Topics:

- **Security Challenges:** Identifying and addressing vulnerabilities in CPS.

- **Data Integrity:** Techniques for ensuring the accuracy and reliability of data.

- **Privacy Measures:** Protecting sensitive information within CPS environments.

20.6 Machine Learning in CPS

Examine the role of machine learning in optimizing the performance and decision-making processes within CPS.

Key Topics:

- **Machine Learning Algorithms:** Applying algorithms to enhance CPS functionality.

- **Optimization:** Using machine learning for predictive maintenance and performance improvement.

- **Decision-Making:** Enhancing automated decision-making processes in CPS.

20.7 Real-Time Systems and CPS

Learn about the real-time requirements of CPS and the design considerations necessary to meet these requirements.

Key Topics:

- **Real-Time Computing:** Understanding the principles of real-time systems.

- **Design Considerations:** Ensuring CPS can meet strict timing constraints.

- **Application Scenarios:** Real-world examples of real-time CPS applications.

20.8 Simulation and Modeling in CPS

Explore tools and methodologies for simulating and modeling CPS to optimize design and operation.

Key Topics:

- **Simulation Tools:** Overview of tools used for CPS simulation.

- **Modeling Techniques:** Creating accurate models of CPS for analysis and optimization.

- **Design Optimization:** Using simulations to improve CPS design and performance.

20.9 Applications and Case Studies of CPS

Analyze various applications of CPS in industries like healthcare, automotive, and smart grids with real-world case studi

Key Topics:

- **Industry Applications:** Exploring how CPS are applied in different sectors.

- **Case Studies:** Reviewing successful implementations and their outcomes.

- **Lessons Learned:** Understanding the challenges and solutions in real-world CPS projects.

These courses provide a comprehensive understanding of Cyber-Physical Systems and their integration within Informat

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21 topics

4.1 .12.15.21.1.Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational techn
educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with bot
methodologies.

21.1.

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decen

21.2.The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integ

21.3.Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educati

21.4.Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certificatio

21.5..DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data m

Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within

21.6.Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case

21.7.Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

21.1 Masters in Distributed-Ledger Technology Applications in Educational Technology

This course explores the integration of distributed ledger technologies (DLT), such as blockchain, into educational techn
educational content, secure credentialing, and enhancing educational efficiencies. The course equips students with bot
methodologies.

21.2 Introduction to Distributed Ledger Technology

An overview of distributed ledger technology including blockchain, its history, and basic principles that empower decen

Key Topics:

- **History of DLT:** Understanding the origins and evolution of distributed ledger technology.
- **Basic Principles:** Exploring the core principles of decentralization, transparency, and immutability.
- **Blockchain Technology:** Introduction to blockchain and how it functions as a distributed ledger.

21.3 The Need for Distributed Ledger Technology in Education

Examine the challenges in the current educational systems and how DLT can address issues around data security, integ

Key Topics:

- **Current Challenges:** Identifying problems such as data breaches, fraud, and inefficiencies.
- **DLT Solutions:** How distributed ledger technology can enhance data security, ensure data integrity, and r
- **Case Examples:** Real-world scenarios where DLT has been implemented in education.

21.4 Blockchain for Secure Credentialing

Explore how blockchain can be used for secure credentialing, providing reliable storage and easy verification of educati

Key Topics:

- **Credentialing Issues:** Understanding the issues with traditional credentialing methods.
- **Blockchain Solutions:** How blockchain ensures secure and tamper-proof credentialing.
- **Verification:** The process of verifying educational credentials using blockchain.

21.5 Smart Contracts in Educational Transactions

Learn about smart contracts and how they can optimize and automate payment systems, enrollments, and certificatior

Key Topics:

- **Smart Contracts:** Understanding what smart contracts are and how they work.
- **Applications in Education:** Using smart contracts for automating payments, enrollments, and certificatior
- **Benefits and Challenges:** Exploring the advantages and potential challenges of implementing smart contr

21.6 DLT-based Learning Management Systems

Investigate the potential of DLT to revolutionize Learning Management Systems (LMS) by enabling decentralized data n

Key Topics:

- **DLT Integration:** How distributed ledger technology can be integrated into LMS.
- **Decentralized Data Management:** Benefits of decentralized data management for educational institution
- **Analytics:** Leveraging DLT for enhanced data analytics and insights.

21.7 Privacy and Data Security in DLT

Understand the privacy considerations and security protocols of DLT systems and how data privacy is enhanced within

Key Topics:

- **Privacy Protocols:** Implementing privacy protocols in DLT systems.
- **Data Security:** Ensuring the security of data stored and managed on distributed ledgers.
- **Educational Contexts:** Specific considerations for enhancing data privacy in educational environments.

21.8 Case Studies of DLT in Education

Review real-world implementations of DLT in education and analyze the outcomes and lessons learned from these case

Key Topics:

- **Case Studies:** Detailed analysis of successful DLT implementations in educational settings.
- **Outcomes:** Understanding the impact of DLT on educational processes.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

21.9 Future Trends in DLT and EdTech

Delve into the emerging trends and future directions of DLT applications in educational technology.

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in DLT and EdTech.
- **Future Directions:** Exploring potential future developments in DLT applications for education.
- **Research and Innovation:** Current and future research initiatives in the field of DLT and educational techn

These courses provide a comprehensive understanding of distributed ledger technology applications in educational tec

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22 topics

4.1 .12.15.22.1.Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on te
learners. The course aims to prepare students to effectively design and implement educational programs that cater to

22.1.Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developme

22.2.Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult ed

22.3.Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

22.4.Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluati

22.5.Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

22.6.Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

22.7.Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

22.8.Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.-

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22.1 Master's in Adult Education Services

This course is designed for educators and professionals aspiring to excel in the field of adult education. It focuses on te
learners. The course aims to prepare students to effectively design and implement educational programs that cater to

22.2 Introduction to Adult Education

An overview of the principles and practices in adult education, including historical perspectives and modern developme

Key Topics:

- **Principles of Adult Education:** Understanding the foundational principles guiding adult education.

- **Historical Perspectives:** Tracing the evolution of adult education practices.
- **Modern Developments:** Exploring recent advancements and trends in adult education.

22.3 Theories of Adult Learning

Exploration of key theories such as Andragogy, Transformative Learning, and Experiential Learning that inform adult ed

Key Topics:

- **Andragogy:** Principles of adult learning introduced by Malcolm Knowles.
- **Transformative Learning:** How transformative experiences foster deep learning in adults.
- **Experiential Learning:** The role of hands-on experiences and reflection in adult learning.

22.4 Curriculum Design for Adult Learners

Techniques and strategies for developing effective curricula tailored to adult learners' needs and goals.

Key Topics:

- **Needs Assessment:** Identifying the learning needs of adult learners.
- **Curriculum Planning:** Creating structured and flexible curricula that accommodate adult learners.
- **Instructional Strategies:** Implementing various teaching methods to enhance learning.

22.5 Assessment and Evaluation in Adult Education

Methods for assessing adult learners' progress and program effectiveness, including formative and summative evaluati

Key Topics:

- **Formative Assessment:** Techniques for ongoing assessment to support learning.
- **Summative Evaluation:** Evaluating learner outcomes at the end of a program.
- **Program Effectiveness:** Measuring the success and impact of adult education programs.

22.6 Technology Integration in Adult Learning

Utilizing digital tools and technologies to enhance adult learning experiences.

Key Topics:

- **E-Learning Platforms:** Using online platforms to deliver educational content.
- **Blended Learning:** Combining face-to-face and online learning methods.

- **Tech Tools:** Incorporating various digital tools to support teaching and learning.

22.7 Diversity and Inclusion in Adult Education

Addressing the diverse backgrounds, identities, and learning styles of adult learners.

Key Topics:

- **Cultural Competence:** Understanding and respecting cultural differences in the classroom.
- **Inclusive Practices:** Implementing strategies to create inclusive learning environments.
- **Learning Styles:** Adapting teaching methods to accommodate different learning styles.

22.8 Motivational Strategies for Adult Learners

Strategies to engage and motivate adult learners, fostering a positive and productive learning environment.

Key Topics:

- **Motivational Theories:** Exploring theories that explain adult learner motivation.
- **Engagement Techniques:** Practical strategies to keep adult learners engaged.
- **Supportive Environment:** Creating a learning environment that encourages persistence and success.

22.9 Professional Development for Adult Educators

Resources and strategies for ongoing professional growth and development in adult education.

Key Topics:

- **Continuing Education:** Opportunities for adult educators to enhance their skills and knowledge.
- **Professional Networks:** Building and leveraging networks for support and growth.
- **Reflective Practice:** Encouraging self-reflection to improve teaching practices.

These courses provide a comprehensive understanding of adult education services, equipping educators with the know

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23 topics

4.1 .12.15.23.1Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of practical implementations of quantum technologies in designing and optimizing complex systems.

23.1.Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including c

23.2.Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for sc

22.3.Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks u

22.4.Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities

22.5.Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped io

22.6.Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

22.7.Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulatio

22.8.Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future research

22.9.Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

23.1 Quantum Computing in Systems Engineering

This course provides an in-depth exploration of quantum computing principles and their applications within the field of practical implementations of quantum technologies in designing and optimizing complex systems.

23.1 Introduction to Quantum Computing

An overview of the principles of quantum mechanics that form the basis of quantum computing technology, including c

Key Topics:

- **Qubits:** Understanding the basic unit of quantum information.

- **Superposition:** How qubits can exist in multiple states simultaneously.

- **Entanglement:** The phenomenon where qubits become interconnected and the state of one affects the s

23.2 Quantum Algorithms

Detailed study of key quantum algorithms such as Shor's algorithm and Grover's algorithm, and their implications for sc

Key Topics:

- **Shor's Algorithm:** How it factors large numbers exponentially faster than classical algorithms.

- **Grover's Algorithm:** Quantum search algorithm providing quadratic speedup.

- **Implications:** Potential applications in cryptography, optimization, and more.

23.3 Quantum Gates and Circuits

Exploration of fundamental quantum gates and the construction of quantum circuits to perform computational tasks u

Key Topics:

- **Quantum Gates:** Basic gates such as Pauli-X, Hadamard, and CNOT.

- **Quantum Circuits:** Building and understanding circuits composed of quantum gates.

- **Quantum Operations:** Executing operations and measuring results.

23.4 Quantum Information Theory

Understanding the theoretical underpinnings of how quantum mechanics enhances information processing capabilities

Key Topics:

- **Quantum Entropy:** Measures of information and uncertainty in quantum systems.

- **Quantum Error Correction:** Techniques to protect quantum information from errors.

- **Quantum Channels:** Understanding communication channels in quantum information theory.

23.5 Quantum Computing Platforms

Introduction to current quantum computing platforms and hardware, including superconducting qubits and trapped io

Key Topics:

- **Superconducting Qubits:** How they work and their role in quantum computers.

- **Trapped Ions:** Another leading technology for building quantum computers.

- **Quantum Hardware:** Overview of different types of quantum computing hardware.

23.6 Quantum Programming Languages

Learning and applying quantum programming languages such as Qiskit, Cirq, and Q# to develop quantum algorithms.

Key Topics:

- **Qiskit:** IBM's open-source quantum computing framework.
- **Cirq:** Google's framework for developing quantum algorithms.
- **Q#:** Microsoft's quantum programming language.
- **Algorithm Development:** Writing and testing quantum algorithms.

23.7 Applications of Quantum Computing in Systems Engineering

Investigation of potential applications of quantum computing in systems engineering, including optimization, simulatio

Key Topics:

- **Optimization:** Using quantum computing to solve complex optimization problems.
- **Simulation:** Quantum simulations of physical systems.
- **Cryptography:** How quantum computing can enhance or break cryptographic systems.

23.8 Challenges and Future of Quantum Computing

Discussion on the current challenges facing the field of quantum computing and potential directions for future researc

Key Topics:

- **Scalability:** Challenges in scaling up quantum computers.
- **Decoherence:** Addressing the issue of qubit stability over time.
- **Future Research:** Directions for advancements in quantum computing technology.

23.9 Quantum Supremacy and its Implications

Examination of the concept of quantum supremacy and its potential to revolutionize computing systems.

Key Topics:

- **Quantum Supremacy:** Understanding what it means for a quantum computer to outperform classical co

- **Implications:** The potential impact on various industries and fields.

- **Milestones:** Significant achievements in reaching quantum supremacy.

These courses provide a comprehensive understanding of quantum computing in systems engineering, equipping stude

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23.1 topics:

4.1 .12.15..23.2.Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in bra theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3.Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current s

23.4.Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in e

23.5.Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and fut

23.6.Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

23.7.Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experi

23.8.Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concern

23.9.Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their o

23.10.Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technolog

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23.2 Neurotechnology in Educational Technology

This course explores the intersection of neurotechnology and educational technology, focusing on how advances in bra theoretical aspects, practical applications, as well as ethical implications of utilizing neurotechnology in education.

23.3 Introduction to Neurotechnology

This topic provides a foundational understanding of neurotechnology, including its history, development, and current s

Key Topics:

- **History and Development:** Tracing the evolution of neurotechnology from its inception to current advanc
- **Devices and Technologies:** Overview of brain-computer interfaces (BCIs), neuroimaging tools, and neurof
- **Current State:** Understanding the latest innovations and applications in neurotechnology.

23.4 Neuroscience Basics for Educators

An overview of essential neuroscience principles necessary for understanding how neurotechnology can be applied in e

Key Topics:

- **Brain Structure:** Understanding the anatomy of the brain and its relevance to learning.
- **Brain Function:** Exploring how different brain regions contribute to cognitive processes.
- **Neuroplasticity:** The brain's ability to adapt and reorganize, crucial for learning and memory.

23.5 Brain-Computer Interfaces in Education

Examine how Brain-Computer Interfaces (BCIs) can be used to facilitate learning, including current applications and fut

Key Topics:

- **BCI Technology:** Understanding how BCIs work and their potential in education.
- **Current Applications:** Examples of BCIs being used to aid learning and accessibility.
- **Future Possibilities:** Exploring innovative ways BCIs could transform education.

23.6 Cognitive Load Theory and Neurotechnology

Understand how cognitive load theory informs the design of neurotechnology applications in learning environments.

Key Topics:

- **Cognitive Load Theory:** Basics of cognitive load and its impact on learning.
- **Application Design:** Designing neurotechnology tools that optimize cognitive load.

- **Practical Examples:** Implementing cognitive load principles in educational technology.

23.7 Neuroscience-Based Adaptive Learning Technologies

Explore how adaptive learning technologies informed by neuroscience can personalize and enhance educational experi

Key Topics:

- **Adaptive Learning:** Principles and benefits of adaptive learning systems.
- **Neuroscience Insights:** How neuroscience informs the design of adaptive learning technologies.
- **Personalization:** Creating personalized learning experiences based on cognitive and neurological data.

23.8 Ethical and Social Implications

Consider the ethical and social implications of using neurotechnology in educational settings, including privacy concern

Key Topics:

- **Ethical Considerations:** Addressing issues such as data privacy, informed consent, and potential biases.
- **Social Implications:** Understanding the broader impact of neurotechnology on society and education.
- **Regulatory Frameworks:** Overview of regulations governing the use of neurotechnology in education.

23.9 Case Studies in Neurotechnology Education

Review real-world case studies where neurotechnology has been applied within educational contexts and assess their o

Key Topics:

- **Case Studies:** Detailed examination of successful neurotechnology implementations in education.
- **Outcomes Assessment:** Evaluating the effectiveness and impact of neurotechnology on learning outcome
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

23.10 Future Trends in Neurotechnology for Education

Discuss and predict future trends in the deployment of neurotechnology for educational purposes, driven by technolog

Key Topics:

- **Emerging Trends:** Identifying new and upcoming trends in neurotechnology and education.
- **Future Directions:** Exploring potential future developments and innovations.
- **Research and Innovation:** Current and future research initiatives in the field of neurotechnology for educ

These courses provide a comprehensive understanding of neurotechnology applications in educational technology, equ

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24. topics

4.1 .12.15.24.1.Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineerin accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. St

24.2Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industri

24.3.Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process d

24.4.RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand thei

24.5.Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision a

24.6.Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-ma

24.7.Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and pr

24.8.RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential so

24.9.Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engin

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4.1 Robotic Process Automation in Electrochemical Engineering

This course explores the integration of Robotic Process Automation (RPA) within the field of Electrochemical Engineerin

accuracy, and productivity in electrochemical processes, ranging from battery manufacturing to fuel cell production. St

24.2 Introduction to Robotic Process Automation

This module introduces the fundamentals of RPA, covering its history, benefits, and applications across various industri

Key Topics:

- **History of RPA:** Understanding the origins and evolution of robotic process automation.
- **Benefits:** Exploring the advantages of RPA, such as increased efficiency, reduced errors, and cost savings.
- **Applications:** Examining how RPA is used in various industries, including finance, healthcare, and manufa

24.3 Fundamentals of Electrochemical Engineering

Explore the core principles of electrochemical engineering, including electrochemistry, materials science, and process d

Key Topics:

- **Electrochemistry Basics:** Understanding the chemical processes involved in electrochemical reactions.
- **Materials Science:** Studying the properties and behaviors of materials used in electrochemical systems.
- **Process Design:** Designing efficient and effective electrochemical processes.

24.4 RPA Tools and Platforms

Gain insights into popular RPA tools and platforms like UiPath, Automation Anywhere, and Blue Prism. Understand thei

Key Topics:

- **UiPath:** Overview of UiPath's features and applications.
- **Automation Anywhere:** Exploring Automation Anywhere's capabilities and use cases.
- **Blue Prism:** Understanding Blue Prism's tools and how they are used in RPA.

24.5 Automating Electrochemical Process Controls

Study the application of RPA in automating the control systems within electrochemical processes, improving precision a

Key Topics:

- **Control Systems Automation:** Techniques for automating control systems in electrochemical processes.
- **Precision and Efficiency:** Enhancing precision and efficiency through automation.
- **Real-World Applications:** Examples of automated control systems in electrochemical engineering.

24.6 Data Collection and Analysis in Electrochemical Systems

Learn how RPA can facilitate data collection, analysis, and reporting in electrochemical systems, enhancing decision-ma

Key Topics:

- **Data Collection:** Techniques for automating data collection in electrochemical systems.
- **Data Analysis:** Using RPA to analyze data and generate insights.
- **Reporting:** Automating the generation of reports to support decision-making.

24.7 Machine Learning and RPA in Electrochemical Engineering

Explore the intersection of machine learning and RPA in electrochemical engineering for predictive maintenance and p

Key Topics:

- **Predictive Maintenance:** Using machine learning and RPA for predictive maintenance of electrochemical
- **Process Optimization:** Enhancing process efficiency and effectiveness through machine learning and RPA
- **Case Studies:** Real-world examples of machine learning and RPA in electrochemical engineering.

24.8 RPA Implementation Challenges and Solutions

Discuss the challenges faced during the implementation of RPA in electrochemical engineering and explore potential so

Key Topics:

- **Implementation Challenges:** Identifying common challenges in RPA implementation.
- **Solutions:** Exploring strategies to overcome implementation challenges.
- **Best Practices:** Establishing best practices for successful RPA implementation.

24.9 Case Studies and Industry Applications

Analyze various case studies to understand how RPA has been applied successfully in the field of electrochemical engin

Key Topics:

- **Case Studies:** Detailed analysis of successful RPA implementations in electrochemical engineering.
- **Industry Applications:** Exploring how different sectors use RPA in electrochemical processes.
- **Lessons Learned:** Understanding the key takeaways from real-world applications.

These courses provide a comprehensive understanding of robotic process automation in electrochemical engineering,

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25.1topics

4.1 .12.15.25.1.Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational te innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials ar

25.2.Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions wil

25.3.Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning

25.4.Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using

25.5.Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

25.6.Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

25.7.Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

25.8.Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their

25.9.Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solu

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25.1 Integrating Educational Technology in Renewable Energy Studies

This course is designed for master's students interested in combining the fields of renewable energy and educational te innovative teaching tools and strategies. Students will learn how to develop technology-driven educational materials ar

25.2 Introduction to Renewable Energy

An overview of various renewable energy sources, including solar, wind, hydroelectric, and geothermal. Discussions wil

Key Topics:

- **Solar Energy:** Principles, benefits, challenges, and global usage.
- **Wind Energy:** How wind power works, its advantages, and current implementation.
- **Hydroelectric Energy:** Understanding the mechanics and impact of hydroelectric power.
- **Geothermal Energy:** Exploring how geothermal energy is harnessed and its benefits.

25.3 Educational Technology Tools

Examines the digital tools and platforms available for creating engaging learning experiences.

Key Topics:

- **Digital Learning Platforms:** Overview of tools like Moodle, Canvas, and Google Classroom.
- **Interactive Tools:** Utilizing tools like Kahoot, Quizlet, and interactive whiteboards.
- **Content Creation:** Software for creating educational content, such as Adobe Captivate and Articulate Sto

25.4 Designing Interactive Learning Modules

This topic covers the methodologies and best practices for designing interactive and immersive learning modules using

Key Topics:

- **Module Design:** Principles of designing effective interactive learning modules.
- **Immersive Learning:** Techniques to create immersive learning experiences.
- **Best Practices:** Strategies to enhance engagement and retention through interactivity.

25.5 Gamification in Renewable Energy Education

Explores the concept of gamification and how game-like elements can enhance learning in renewable energy courses.

Key Topics:

- **Gamification Principles:** Understanding the basics of gamification and its educational benefits.
- **Application in Education:** Implementing game elements like points, badges, and leaderboards in renewab
- **Impact on Learning:** How gamification improves motivation and engagement.

25.6 Virtual Labs and Simulations

Discusses the role of virtual labs and simulations in teaching complex renewable energy concepts.

Key Topics:

- **Virtual Labs:** Benefits and examples of virtual labs in renewable energy education.
- **Simulations:** Using simulations to teach and experiment with renewable energy concepts.
- **Implementation:** Best practices for integrating virtual labs and simulations into the curriculum.

25.7 Assessing Learner Outcomes in Technology-Driven Curriculum

This topic focuses on developing assessment strategies for technology-enhanced renewable energy education.

Key Topics:

- **Assessment Methods:** Different methods for assessing learner outcomes in tech-driven education.
- **Formative and Summative Assessment:** Utilizing both to measure progress and final understanding.
- **Data Analysis:** Using data from assessments to improve teaching strategies and learning outcomes.

25.8 Case Studies in Renewable Energy Education

Analyzes real-world examples of successful renewable energy educational programs and the role of technology in their

Key Topics:

- **Case Studies:** Detailed analysis of successful implementations of educational technology in renewable en
- **Technology's Role:** Understanding how technology facilitated learning and engagement.
- **Lessons Learned:** Key takeaways and best practices from real-world examples.

25.9 Challenges in Integrating Technology and Renewable Energy Education

Addresses common challenges faced when integrating technology into renewable energy education and potential solu

Key Topics:

- **Common Challenges:** Identifying barriers such as funding, access to technology, and teacher training.
- **Solutions:** Strategies to overcome these challenges.
- **Future Directions:** Exploring future trends and innovations in the field.

These courses provide a comprehensive understanding of how educational technology can be integrated into renewab

4.1 .12.15.26.1Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trad control, logistics, procurement, and market analysis. The course will blend technical engineering concepts with busines

26.2.Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial marke

26.3.Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging techn

26.4.Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to c

26.5.Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and

26.6.Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective

26.7.Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholes

27.8.Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation

27.9.Regulatory and Ethical Considerations

Explore the regulatory landscape affecting wholesale trade and the ethical considerations of operating within the secto

26.1 Wholesale Trade Management in Industrial Engineering

This course is designed for students pursuing a Master's degree in Industrial Engineering with a focus on wholesale trad control, logistics, procurement, and market analysis. The course will blend technical engineering concepts with busines

26.2 Introduction to Wholesale Trade

Explore the fundamentals of wholesale trade, its role in the supply chain, and the economic impact on industrial marke

Key Topics:

- **Fundamentals:** Understanding the basics of wholesale trade.
- **Role in Supply Chain:** How wholesale trade fits within the broader supply chain.
- **Economic Impact:** Examining the economic significance of wholesale trade on industrial markets.

26.3 Supply Chain Dynamics

Understand the complexities of supply chain management, including network design, integration, and leveraging techn

Key Topics:

- **Network Design:** Principles of designing efficient supply chain networks.
- **Integration:** Integrating various components of the supply chain for seamless operations.
- **Technology:** Utilizing technology to enhance supply chain efficiency.

26.4 Inventory Control Methods

Study various inventory management techniques, such as Just-In-Time, Economic Order Quantity, and ABC analysis to c

Key Topics:

- **Just-In-Time (JIT):** Minimizing inventory holding costs by receiving goods only as needed.
- **Economic Order Quantity (EOQ):** Calculating the optimal order quantity to minimize total inventory costs
- **ABC Analysis:** Categorizing inventory to prioritize management efforts.

26.5 Logistics and Distribution

Examine the logistics involved in wholesale trade, focusing on distribution networks, transportation management, and

Key Topics:

- **Distribution Networks:** Designing and managing distribution networks.
- **Transportation Management:** Efficiently managing transportation logistics.
- **Warehousing Solutions:** Implementing effective warehousing strategies.

26.6 Procurement Strategies

Learn about procurement processes and strategies, vendor selection, and relationship management to secure effective

Key Topics:

- **Procurement Processes:** Understanding procurement procedures and best practices.

- **Vendor Selection:** Criteria for selecting and evaluating vendors.
- **Relationship Management:** Building and maintaining strong supplier relationships.

26.7 Market Analysis and Forecasting

Study techniques for market analysis, trend observation, and forecasting methods to drive strategic decisions in wholes

Key Topics:

- **Market Analysis:** Techniques for analyzing market conditions and trends.
- **Trend Observation:** Identifying and interpreting market trends.
- **Forecasting Methods:** Using quantitative and qualitative methods to predict future market conditions.

26.8 Risk Management in Wholesale Trade

Analyze risk management principles, identifying potential risks in the wholesale supply chain and developing mitigation

Key Topics:

- **Risk Identification:** Identifying potential risks in the supply chain.
- **Mitigation Strategies:** Developing strategies to mitigate identified risks.
- **Risk Management Frameworks:** Implementing risk management frameworks to ensure supply chain resil

26.9 Regulatory and Ethical Considerations

Understand the regulatory and ethical considerations in wholesale trade, including compliance with laws and promotin

Key Topics:

- **Regulatory Compliance:** Ensuring adherence to relevant laws and regulations.
- **Ethical Business Practices:** Promoting ethical behavior and corporate social responsibility.
- **Case Studies:** Analyzing real-world examples of regulatory and ethical challenges in wholesale trade.

These courses provide a comprehensive understanding of wholesale trade management in industrial engineering, equi

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28.topics

4.1 .12.15..29. 1.Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for st technologies to prepare students for careers in the telecommunications industry.

29.2.Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

29.3.Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

29.4.Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and ir

29.5.Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share th

29.6.Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

29.7.Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

29.8..Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

29.8Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication m

29.6IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT impleme

29.1 Advanced Wireless Communications

This course explores the fundamental principles and advanced techniques of wireless communications, designed for st technologies to prepare students for careers in the telecommunications industry.

29.2 Introduction to Wireless Communications

Overview of wireless communication systems, historical developments, and contemporary applications.

Key Topics:

- **Wireless Communication Systems:** Basic principles and components of wireless communication systems.

- **Historical Developments:** Key milestones in the evolution of wireless communications.
- **Contemporary Applications:** Current uses of wireless technology in various fields.

29.3 Radio Frequency Fundamentals

Exploration of radio frequency (RF) spectrum, key RF principles, and their application in wireless communication.

Key Topics:

- **RF Spectrum:** Understanding the RF spectrum and its allocation.
- **RF Principles:** Basics of RF communication, including modulation and demodulation.
- **Applications:** Practical uses of RF technology in wireless communication.

29.4 Wireless Signal Propagation

Understanding the behavior of wireless signals over various media and environments, including path loss, fading, and ir

Key Topics:

- **Signal Propagation:** How wireless signals travel through different media.
- **Path Loss:** Factors affecting the attenuation of signal strength.
- **Fading and Interference:** Understanding and mitigating fading and interference effects.

29.5 Multiple Access Techniques

Survey of multiple access schemes including FDMA, TDMA, CDMA, and OFDMA, which enable multiple users to share th

Key Topics:

- **FDMA (Frequency Division Multiple Access):** Assigning different frequency bands to multiple users.
- **TDMA (Time Division Multiple Access):** Allocating time slots to multiple users on the same frequency.
- **CDMA (Code Division Multiple Access):** Using unique codes to differentiate users sharing the same frequ
- **OFDMA (Orthogonal Frequency Division Multiple Access):** Combining multiple sub-carriers to improve ef

29.6 Wireless Networking and Protocols

Introduction to wireless network design, including protocol layers, network architectures, and routing protocols.

Key Topics:

- **Protocol Layers:** Understanding the different layers in wireless communication protocols.

- **Network Architectures:** Designing and implementing wireless network architectures.

- **Routing Protocols:** Overview of routing protocols used in wireless networks.

29.7 Cellular Systems and 5G

In-depth analysis of cellular network architecture, with a focus on the evolution from 1G to 5G, and future trends.

Key Topics:

- **Cellular Network Architecture:** Structure and components of cellular networks.

- **1G to 5G Evolution:** Historical progression and key features of each generation.

- **Future Trends:** Emerging technologies and advancements in cellular communications.

29.8 Antenna Theory and Design

Study of antenna characteristics, types, and their utilization in wireless communication systems.

Key Topics:

- **Antenna Characteristics:** Key parameters and performance metrics of antennas.

- **Types of Antennas:** Different types of antennas used in wireless communication.

- **Design and Utilization:** Designing and deploying antennas for optimal performance.

29.9 Wireless Security

Exploration of security challenges and solutions in wireless communications, including encryption and authentication m

Key Topics:

- **Security Challenges:** Identifying common security threats in wireless communication.

- **Encryption:** Techniques for securing wireless communication through encryption.

- **Authentication:** Methods for verifying the identity of users and devices.

29.10 IoT and Wireless Sensor Networks

Examination of Internet of Things (IoT) concepts, architectures, and the role of wireless sensor networks in IoT impleme

Key Topics:

- **IoT Concepts:** Understanding the basic principles and applications of IoT.

- **Architectures:** Designing IoT systems and integrating wireless sensor networks.

- **Wireless Sensor Networks:** Deploying and managing sensor networks for IoT applications.

These courses provide a comprehensive understanding of advanced wireless communications, equipping students with

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30 topics

4.1 .12.15.30.1.Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in constructio the challenges of implementing sustainable energy solutions, and the latest technologies in the field. Emphasis is place

30.2. Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring syste

30.3.Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

30.4.Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

30.5Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

30.6.Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

30.7.Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standar

30.8.Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

30.9.Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water

Advanced Electrical Engineering in Construction and Civil Engineering

This course provides an in-depth understanding of electrical engineering principles and their applications in constructio the challenges of implementing sustainable energy solutions, and the latest technologies in the field. Emphasis is place

30.2 Fundamentals of Electrical Systems in Construction

Overview of electrical systems essential in construction projects, including power distribution, lighting, and wiring syste

Key Topics:

- **Power Distribution:** Understanding the design and implementation of power distribution systems.
- **Lighting Systems:** Techniques for efficient lighting design in construction projects.
- **Wiring Systems:** Best practices for wiring systems, including safety and compliance.

30.3 Electrical Safety Standards and Codes

Detailed study of electrical safety standards, codes, and regulations specific to construction sites.

Key Topics:

- **Safety Standards:** Overview of key electrical safety standards.
- **Codes and Regulations:** Understanding and complying with electrical codes and regulations.
- **Site Safety:** Implementing safety practices on construction sites to prevent electrical hazards.

30.4 Integration of Electrical Systems in Building Design

Techniques for integrating electrical systems with architectural and structural frameworks in buildings.

Key Topics:

- **System Integration:** Strategies for seamlessly integrating electrical systems within building designs.
- **Coordination with Other Trades:** Ensuring coordination between electrical systems and other constructio
- **Design Optimization:** Techniques for optimizing electrical designs for efficiency and performance.

30.5 Sustainable and Renewable Energy Technologies

Exploration of sustainable and renewable energy technologies applicable to construction projects.

Key Topics:

- **Solar Energy:** Implementation of solar panels and photovoltaic systems in construction.
- **Wind Energy:** Integrating wind turbines and other wind energy systems.
- **Energy Storage:** Utilizing energy storage solutions such as batteries and thermal storage.

30.6 Smart Grids and Intelligent Networks

Study of smart grid technologies and their application in modern urban infrastructure.

Key Topics:

- **Smart Grid Technologies:** Understanding the components and benefits of smart grids.
- **Intelligent Networks:** Designing and managing intelligent networks for energy distribution.
- **Urban Infrastructure:** Applying smart grid technologies to modern urban infrastructure projects.

30.7 Electrical System Design and Simulation

Practical approaches to the design and simulation of electrical systems for construction projects using industry-standar

Key Topics:

- **Design Software:** Tools and software for electrical system design and simulation.
- **Simulation Techniques:** Methods for simulating electrical systems to predict performance.
- **Project Examples:** Case studies of electrical system design and simulation in real-world projects.

30.8 Power Quality and Energy Management

Analysis of power quality issues and energy management strategies for improved efficiency.

Key Topics:

- **Power Quality:** Identifying and addressing power quality issues such as voltage sags, harmonics, and tran
- **Energy Management:** Strategies for efficient energy management in construction projects.
- **Efficiency Improvement:** Techniques for improving the overall efficiency of electrical systems.

30.9 Electrical Systems in Infrastructure Projects

Examination of the role of electrical engineering in large-scale infrastructure projects, such as transportation and water

Key Topics:

- **Transportation Systems:** Electrical engineering applications in transportation infrastructure.
- **Water Systems:** Designing and managing electrical systems in water treatment and distribution.
- **Infrastructure Projects:** Examples of large-scale infrastructure projects and their electrical requirements.

These courses provide a comprehensive understanding of advanced electrical engineering principles and their applicati

4.1 .12.15.Electrical Systems in Construction and Civil Engineering

This master's level course is designed to bridge the fields of construction and civil engineering with electrical engineeri efficiency, and innovation in modern infrastructure.

Introduction to Electrical Systems in Construction

Overview of electrical systems integration in construction projects, considering design, installation, and maintenance.

Power Distribution in Buildings

Explore the principles and challenges of power distribution systems in modern buildings, including load assessments an

Lighting Systems and Design

Study the design and implementation of efficient lighting systems in commercial and residential buildings.

Electrical Safety Standards and Regulations

Learn about international and local electrical safety standards and regulations pertinent to construction projects.

Sustainability in Electrical Engineering

Understand sustainable practices and technologies, such as solar power and energy efficiency in construction.

Smart Buildings and IoT Integration

Examine the incorporation of smart technologies and IoT in building systems for improved energy management and au

Electrical Load Analysis and Estimation

Learn methods to analyze electrical loads and estimate demand for optimal system design.

Integration of Renewable Energy Sources

Explore the potential of integrating renewable energy sources into construction projects and urban environments.

Project Management in Electrical Engineering

Develop skills in managing electrical engineering projects within the construction industry, focusing on timelines, budge

30.1topics

4.1 .12.15.30.1.Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Student

30.2.Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a

30.3Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power

30.4.Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for ef

31.5.Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

31.6..High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

31.7.Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

31.8Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure pr

31.1Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projec

30.1 Doctorate in Specialist Engineering Infrastructure and Contractors: Electrical Engineering

This advanced course is designed for students pursuing a Doctorate degree in Specialist Engineering Infrastructure and practical skills necessary for the design, implementation, and management of electrical infrastructure projects. Student

30.2 Advanced Power System Analysis

Exploration of power flow analysis, fault analysis, and stability assessment in large-scale electrical power systems with a

Key Topics:

- **Power Flow Analysis:** Techniques for analyzing the flow of electrical power in networks.
- **Fault Analysis:** Identifying and mitigating faults in power systems.
- **Stability Assessment:** Evaluating and ensuring the stability of power systems.

30.3 Renewable Energy Systems

An in-depth examination of renewable energy technology integration, focusing on wind, solar, and hydroelectric power

Key Topics:

- **Wind Energy:** Understanding the technology and integration of wind power systems.
- **Solar Energy:** Exploring photovoltaic systems and their applications.
- **Hydroelectric Power:** Implementing hydroelectric systems in renewable energy projects.

30.4 Electrical Infrastructure Design and Management

Comprehensive overview of electrical infrastructure planning, design methodologies, and management practices for ef

Key Topics:

- **Infrastructure Planning:** Strategies for effective electrical infrastructure planning.
- **Design Methodologies:** Best practices in designing electrical infrastructure.
- **Management Practices:** Techniques for managing and maintaining electrical systems.

31.5 Smart Grids and IoT Applications

Study of smart grid technology, IoT applications in electrical systems, and their impact on efficiency and sustainability.

Key Topics:

- **Smart Grid Technology:** Understanding the components and benefits of smart grids.
- **IoT in Electrical Systems:** Integrating IoT devices to enhance electrical system performance.
- **Efficiency and Sustainability:** Improving efficiency and sustainability through smart grid and IoT applicatic

31.6 High Voltage Engineering

Analysis of high voltage engineering principles, equipment, and testing methodologies in power transmission.

Key Topics:

- **High Voltage Principles:** Core principles of high voltage engineering.
- **Equipment:** Understanding high voltage equipment and its applications.
- **Testing Methodologies:** Techniques for testing and ensuring the reliability of high voltage systems.

31.7 Project Management in Electrical Engineering

Principles and practices of effective project management tailored to electrical engineering projects and infrastructure.

Key Topics:

- **Project Planning:** Techniques for planning electrical engineering projects.

- **Resource Management:** Managing resources effectively in electrical projects.

- **Risk Management:** Identifying and mitigating risks in project management.

31.8 Energy Policy and Ethical Considerations

Examination of energy policies, regulatory frameworks, and ethical considerations impacting electrical infrastructure pr

Key Topics:

- **Energy Policies:** Understanding policies that influence electrical engineering.

- **Regulatory Frameworks:** Complying with regulations in electrical infrastructure projects.

- **Ethical Considerations:** Addressing ethical issues in electrical engineering.

31.9 Sustainable Electrical Engineering Practices

Strategies for incorporating sustainable practices in the planning, design, and execution of electrical engineering projec

Key Topics:

- **Sustainable Design:** Principles of designing sustainable electrical systems.

- **Energy Efficiency:** Implementing energy-efficient practices in electrical engineering.

- **Environmental Impact:** Reducing the environmental impact of electrical projects.

These courses provide a comprehensive understanding of specialist engineering infrastructure and contractors with a f
within the field

Admission Ready - Completing your application - Atlantic International University

32.Topic

4.1 .12.15..32.1Clean Energy Technology: Ecotechnology Applications

This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explore
environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing cl

32.3.Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote su

32.4.Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in sus

32.5.Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy so

32.6.Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass

32.7.Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing o

32.8.Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean ene

32.9.Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliabilit

32.10.Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotec

32.11Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the en

32.12.Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and developme

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2.1 Clean Energy Technology: Ecotechnology Applications

This course provides an in-depth understanding of clean energy technologies with a focus on ecotechnology. It explore
environmental impacts and fostering ecological balance. Students will gain expertise in evaluating and implementing cl

32.3 Introduction to Clean Energy and Ecotechnology

An overview of clean energy principles, the importance of ecotechnology, and how these fields integrate to promote su

Key Topics:

- **Clean Energy Principles:** Understanding the basic concepts of clean energy.
- **Importance of Ecotechnology:** The role of ecotechnology in achieving sustainable development.
- **Integration:** How clean energy and ecotechnology work together to promote environmental sustainabilit

32.4 Solar Energy Technologies

Exploration of solar energy systems, including photovoltaic and solar thermal technologies, and their applications in su

Key Topics:

- **Photovoltaic Systems:** Basics and applications of photovoltaic solar panels.
- **Solar Thermal Technologies:** Understanding solar thermal energy and its uses.
- **Sustainable Solutions:** Implementing solar technologies in sustainable energy projects.

32.5 Wind Energy Systems

Study of wind energy generation, the mechanics of wind turbines, and the potential of wind power as a clean energy so

Key Topics:

- **Wind Energy Generation:** Principles of generating energy from wind.
- **Wind Turbines:** Mechanics and design of wind turbines.
- **Potential and Applications:** Evaluating the potential of wind power as a renewable energy source.

32.6 Bioenergy and Biomass

Understanding the role of biomass in clean energy systems, including conversion technologies and sustainable biomass

Key Topics:

- **Biomass:** Types of biomass used in energy production.
- **Conversion Technologies:** Methods of converting biomass into usable energy.
- **Sustainable Sourcing:** Ensuring sustainable practices in sourcing biomass.

32.7 Hydropower and Ocean Energy

Exploration of hydropower technologies and emerging ocean energy systems such as tidal and wave energy, focusing o

Key Topics:

- **Hydropower Technologies:** Basics of hydropower generation.
- **Ocean Energy Systems:** Understanding tidal and wave energy technologies.
- **Ecological Impact:** Assessing the ecological effects of hydropower and ocean energy projects.

32.8 Geothermal Energy

An examination of geothermal energy technologies, their environmental implications, and their role in global clean ene

Key Topics:

- **Geothermal Technologies:** Basics of geothermal energy production.
- **Environmental Implications:** Understanding the impact of geothermal energy on the environment.
- **Global Strategies:** Role of geothermal energy in worldwide clean energy initiatives.

32.9 Energy Storage and Smart Grids

Understanding the role of energy storage technologies and smart grid systems in enhancing the efficiency and reliabilit

Key Topics:

- **Energy Storage Technologies:** Exploring different types of energy storage solutions.
- **Smart Grids:** Basics of smart grid technology and its benefits.
- **Efficiency and Reliability:** Improving energy distribution through advanced storage and smart grid system

32.10 Policy and Economics of Clean Energy

Analysis of the policies and economic factors that influence clean energy adoption, with a focus on incentivizing ecotec

Key Topics:

- **Clean Energy Policies:** Understanding the policy landscape for clean energy.
- **Economic Factors:** Evaluating the economic benefits and challenges of clean energy adoption.
- **Incentives:** Exploring incentives and support mechanisms for ecotechnology innovations.

32.11 Ecological Impact of Renewable Energy

Evaluating the ecological impacts of renewable energy projects and the methods to mitigate negative effects on the en

Key Topics:

- **Impact Assessment:** Techniques for assessing the ecological impact of renewable energy projects.
- **Mitigation Strategies:** Methods to reduce the environmental impact of clean energy systems.
- **Best Practices:** Implementing best practices for ecological sustainability in renewable energy.

32.12 Future Directions in Clean Energy and Ecotechnology

Exploration of upcoming trends and innovations in clean energy and ecotechnology, including research and developme

Key Topics:

- **Emerging Trends:** Identifying new trends and innovations in clean energy and ecotechnology.
- **Research and Development:** Current and future research initiatives in the field.
- **Future Prospects:** Predicting future directions and advancements in clean energy and ecotechnology.

These courses provide a comprehensive understanding of clean energy technology and ecotechnology applications, eq

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33.Topics

4.1 .12.15.33.1Integration of Electronic Engineering in Construction and Civil Engineering

This course aims to explore the integration of electronic engineering principles within the domains of construction and smart infrastructure, and sustainable development. Students will gain interdisciplinary knowledge and practical skills to

33.2.Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineeri

33.3.Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and auto

33.4.IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

33.5.Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

33.6.Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and preci

33.7.Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engine

33.8.Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

33.9.Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems to protect smart civil infrastructure from digital threats.

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33.1 Integration of Electronic Engineering in Construction and Civil Engineering

This course aims to explore the integration of electronic engineering principles within the domains of construction and smart infrastructure, and sustainable development. Students will gain interdisciplinary knowledge and practical skills to

33.2 Introduction to Electronic Systems in Civil Engineering

This topic provides an overview of the role and importance of electronic systems in the construction and civil engineeri

Key Topics:

- **Role and Importance:** Understanding how electronic systems are essential in modern construction and ci
- **Applications:** Examples of electronic systems used in these industries.
- **Technological Integration:** How electronic engineering is integrated into construction projects.

33.3 Smart Construction Technologies

Exploring various smart construction technologies enabled by electronic systems such as sensors, IoT devices, and auto

Key Topics:

- **Sensors:** Use of sensors for real-time monitoring and data collection.
- **IoT Devices:** Implementing IoT devices to create connected construction sites.
- **Automation:** Enhancing construction processes through automation technologies.

33.4 IoT in Infrastructure Management

Understanding how IoT devices are used in managing and monitoring infrastructure and civil engineering projects.

Key Topics:

- **IoT Devices:** Types and functions of IoT devices in infrastructure management.
- **Monitoring:** Techniques for using IoT to monitor infrastructure health and performance.
- **Management:** Strategies for managing infrastructure projects using IoT technologies.

33.5 Electronic Monitoring and Control Systems

This topic covers the usage of electronic systems for monitoring and control within large-scale construction projects.

Key Topics:

- **Monitoring Systems:** Implementing electronic systems to monitor construction activities.
- **Control Systems:** Using electronic control systems to manage construction processes.
- **Large-Scale Projects:** Examples of electronic monitoring and control in large construction projects.

33.6 Automation in Construction Machinery

Explore how electronic engineering drives the automation of construction machinery for enhanced efficiency and preci

Key Topics:

- **Construction Machinery:** Types of machinery that can be automated.
- **Efficiency and Precision:** Benefits of automation in construction machinery.
- **Technology Integration:** How electronic engineering enables automation in construction equipment.

33.7 Solar and Renewable Energy Systems in Civil Engineering

Investigate how electronic engineering aids in integrating solar and renewable energy systems into modern civil engine

Key Topics:

- **Solar Energy Systems:** Design and integration of solar energy solutions.
- **Renewable Energy:** Incorporating various renewable energy sources in civil engineering.
- **Sustainability:** Promoting sustainable development through renewable energy systems.

33.8 Building Information Modeling (BIM) and Electronic Systems

Understand the role of electronic systems in enhancing Building Information Modeling processes.

Key Topics:

- **BIM Technology:** Basics and benefits of Building Information Modeling.
- **Electronic Integration:** How electronic systems improve BIM processes.
- **Efficiency and Collaboration:** Enhancing project efficiency and collaboration through BIM.

33.9 Cybersecurity in Smart Infrastructure

Learn about the importance of cybersecurity systems in protecting smart infrastructure from cyber threats.

Key Topics:

- **Cybersecurity Principles:** Understanding the basics of cybersecurity.
- **Smart Infrastructure:** Identifying vulnerabilities in smart infrastructure systems.
- **Protection Strategies:** Implementing cybersecurity measures to protect smart infrastructure.

These courses provide a comprehensive understanding of how electronic engineering can be integrated into constructi electronic solution

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34.1.Topic

4.1 .12.15..34.2.Masters in Immutable Data Storage Solutions for Web Design

This course provides an advanced understanding of immutable data storage solutions specifically tailored for web desig practices in the context of developing modern, resilient web applications.

34.3.Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential

33.4.Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages

33.5.Immutable.js and Alternatives

An examination of popular libraries like Immutable.js and other alternatives that offer immutable data structures in Jav

33.6.State Management with Immutable Data

Exploring how immutable data can simplify state management in web applications, with a focus on integrating with pop

33.7.Performance Benefits of Immutable Data

Investigating the performance benefits that immutable data can bring to web applications and how these benefits can

33.8.GraphQL and Immutable Data

Integrating immutable data with GraphQL endpoints and understanding the implications for web application design.

33.9.Immutable Data in Server-Side Rendering (SSR)

Utilizing immutable data in server-side rendering processes to boost performance and maintain data consistency.

33.10.Security and Immutable Data

Understanding security concerns and best practices when implementing immutable data storage solutions in web appl

33.11.Future Trends in Immutable Data

Exploring future trends and developments in immutable data storage solutions and how they might impact web design

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34.2 Introduction to Immutable Data

An overview of immutable data, its importance in web design, and basic concepts such as data structures and potential

Key Topics:

- **Basics of Immutable Data:** Understanding what immutable data is and why it's important.
- **Data Structures:** Exploring the types of data structures used in immutable data.
- **Benefits:** Identifying the potential benefits of using immutable data in web design.

34.3 Immutable Data Structures

Discussion on various immutable data structures such as lists, sets, and maps. Understanding their use and advantages

Key Topics:

- **Lists:** Using immutable lists and their advantages.
- **Sets:** Implementing immutable sets for unique data storage.
- **Maps:** Exploring the use of immutable maps and their benefits.

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- **Maps:** Exploring the use of immutable maps and their benefits.

35.1.Topic

4.1 .12.15..35.2.Advanced Cyber-Physical Systems in Telecommunications

This course explores the intersection of cyber-physical systems and telecommunications, providing an in-depth underst
design, and implementation of next-generation telecommunication systems using cyber-physical components, with a k

35.3.Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the

35.4.Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network p

35.5..IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunicatio

35.6.Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

35.7.Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and

35.8.Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within tele----------communications.

35.9.Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

35.10.CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

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design, and implementation of next-generation telecommunication systems using cyber-physical components, with a k

35.3 Introduction to Cyber-Physical Systems

Understand the core concepts and significance of cyber-physical systems (CPS) in the modern world, particularly in the

Key Topics:

- **Core Concepts:** Basics of CPS and their importance in modern technology.
- **Significance:** Understanding why CPS are crucial in telecommunications.
- **Applications:** Various applications of CPS in different sectors.

35.4 Network Architecture in CPS

Study the architectural principles of integrating CPS with telecommunication networks, including topologies, network p

Key Topics:

- **Architectural Principles:** Fundamentals of network architecture in CPS.
- **Topologies:** Different types of network topologies used in CPS.
- **Network Protocols:** Understanding network protocols for CPS integration.
- **Infrastructure:** Building and managing CPS infrastructure in telecommunications.

35.5 IoT and Cyber-Physical Systems

Explore the role of the Internet of Things (IoT) as a component of CPS, focusing on its application in telecommunicatio

Key Topics:

- **IoT Basics:** Understanding the fundamentals of IoT.
- **IoT in CPS:** How IoT devices integrate with CPS.
- **Applications in Telecommunications:** Using IoT for enhancing telecommunications systems.

35.6 Security and Privacy in CPS

Examine security challenges and privacy concerns in CPS, particularly how these affect telecommunication systems.

Key Topics:

- **Security Challenges:** Identifying and addressing security issues in CPS.
- **Privacy Concerns:** Ensuring data privacy in CPS applications.
- **Impact on Telecommunications:** Understanding how security and privacy issues affect telecom systems.

35.7 Real-time Data Processing and Analytics

Learn about the techniques and technologies used for real-time data processing and analytics in the context of CPS and

Key Topics:

- **Real-time Processing:** Techniques for real-time data processing in CPS.
- **Analytics:** Using analytics to gain insights from CPS data.
- **Technologies:** Tools and technologies for real-time data processing and analytics.

35.8 Machine Learning in Cyber-Physical Systems

Understand how machine learning can be applied to optimize and innovate CPS within telecommunications.

Key Topics:

- **Machine Learning Basics:** Introduction to machine learning concepts.
- **Applications in CPS:** How machine learning enhances CPS functionality.
- **Telecommunications:** Using machine learning for innovative solutions in telecom systems.

35.9 Emerging Trends in CPS and Telecommunications

Discover the latest research and technological trends shaping the future of CPS in the telecom sector.

Key Topics:

- **Research Developments:** Latest research in CPS and telecommunications.
- **Technological Trends:** Emerging technologies impacting CPS.
- **Future Prospects:** Predicting the future of CPS in the telecommunications industry.

35.10 CPS Case Studies in Telecommunications

Analyze real-world case studies where CPS has been effectively integrated into telecommunications systems.

Key Topics:

- **Case Studies:** Detailed analysis of successful CPS implementations.

- **Integration Strategies:** Understanding strategies for integrating CPS in telecom systems.

- **Lessons Learned:** Key takeaways from real-world CPS applications in telecommunications.

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36. Topics:

37. Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of softwa
solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and

4.1 .12.15..36.1.Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding ho

36.2.Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transfo

36.3.Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how

36.4.Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extra

36.5.Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for ad

36.6.Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven

36.7.AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to

36.8.Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias,

36.8.Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments

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37.1 Master's Program in Artificial Intelligence and Machine Learning for Software Engineering

This course provides an in-depth exploration of artificial intelligence and machine learning within the context of softwa solutions efficiently within software applications. The course covers fundamental concepts, advanced techniques, and

37.2 Introduction to Artificial Intelligence and Machine Learning

This topic covers the fundamental concepts, history, and evolution of AI and ML, providing a basis for understanding ho

Key Topics:

- **Fundamental Concepts:** Basics of AI and ML, including key definitions and principles.
- **History and Evolution:** Tracing the development of AI and ML over time.
- **Impact on Software Engineering:** Understanding how AI and ML are transforming the field of software en

37.3 Data Preprocessing and Feature Engineering

This module focuses on preparing data for machine learning models, involving data cleaning, normalization, and transfo

Key Topics:

- **Data Cleaning:** Techniques for handling missing values, outliers, and inconsistencies in data.
- **Normalization and Transformation:** Methods for scaling and transforming data for better model perform
- **Feature Engineering:** Creating and selecting relevant features to enhance model accuracy.

37.4 Supervised Learning Techniques

Discover various supervised learning algorithms such as regression, decision trees, and neural networks, and learn how

Key Topics:

- **Regression:** Linear and logistic regression techniques.
- **Decision Trees:** Understanding how decision trees work and their applications.
- **Neural Networks:** Basics of neural networks and how they can be used in supervised learning.

37.5 Unsupervised Learning and Clustering

Explore unsupervised learning methods, including clustering and dimensionality reduction, which are essential for extra

Key Topics:

- **Clustering:** Techniques such as K-means, hierarchical clustering, and DBSCAN.
- **Dimensionality Reduction:** Methods like PCA (Principal Component Analysis) and t-SNE.
- **Applications:** Real-world applications of unsupervised learning in software systems.

37.6 Deep Learning and Neural Networks

This topic delves into the structure and function of neural networks, focusing on deep learning techniques crucial for a

Key Topics:

- **Deep Learning:** Understanding deep learning architectures like CNNs (Convolutional Neural Networks) ar
- **Neural Network Structures:** Layers, activation functions, and backpropagation.
- **Advanced Techniques:** Exploring advanced topics such as transfer learning and generative adversarial ne

37.7 Natural Language Processing

Gain an understanding of techniques to process and analyze human language data, facilitating the creation of AI-driven

Key Topics:

- **Text Preprocessing:** Techniques for tokenization, stemming, and lemmatization.
- **NLP Models:** Understanding models like Word2Vec, BERT, and GPT.
- **Applications:** Implementing NLP in chatbots, sentiment analysis, and other applications.

37.8 AI/ML in Software Development Lifecycle

Learn how AI and ML can be integrated into different stages of software development, from requirement gathering to

Key Topics:

- **Requirement Gathering:** Using AI for requirement analysis and specification.
- **Development:** Incorporating AI/ML algorithms into software development processes.
- **Testing:** Automated testing and bug detection using AI.
- **Deployment:** Best practices for deploying AI/ML solutions in production environments.

37.9 Ethical and Responsible AI

Address the ethical considerations and responsibilities in AI, focusing on issues such as bias, transparency, and account

Key Topics:

- **Bias and Fairness:** Identifying and mitigating biases in AI models.
- **Transparency:** Ensuring transparency in AI decision-making processes.
- **Accountability:** Establishing accountability for AI outcomes and decisions.

37.10 Deployment and Scaling of AI Solutions

Learn the practical considerations and challenges of deploying and scaling AI/ML solutions in production environments

Key Topics:

- **Deployment Challenges:** Overcoming challenges in deploying AI solutions.
- **Scaling Techniques:** Techniques for scaling AI/ML models to handle large volumes of data.
- **Performance Monitoring:** Ensuring ongoing performance and reliability of AI solutions.

These courses provide a comprehensive understanding of artificial intelligence and machine learning for software engi

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37..Topics:

4.1 .12.15.37.1.Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

This course provides an in-depth exploration of the engineering principles and technological innovations driving autono between hardware design, software development, and system integration to equip students with the skills to design, te

37.1.Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

37.2Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

37.3.Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data process

37.4.Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

37.5.Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

37.6.Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

37.7Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicl

37.8.Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

37.9.Integration of Renewable Energy in Autonomous Systems

Integration of renewable energy sources like solar and wind power into autonomous systems to enhance sustainability

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37.1 Advanced Studies in Autonomous Vehicles and Drones for Electric Vehicle Engineering

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between hardware design, software development, and system integration to equip students with the skills to design, te

37.2 Introduction to Autonomous Systems

An overview of autonomous vehicle and drone technologies, including historical development and future trends.

Key Topics:

- **Historical Development:** Tracing the evolution of autonomous systems from inception to present day.
- **Technologies:** Key technologies driving autonomous vehicles and drones.
- **Future Trends:** Predicting the future advancements and trends in autonomous systems.

37.3 Electric Vehicle Engineering Basics

Foundational concepts of electric vehicle engineering, including battery technology and electric motor design.

Key Topics:

- **Battery Technology:** Understanding the types, design, and performance of batteries used in electric vehi
- **Electric Motor Design:** Basics of electric motor functionality and design.
- **Charging Systems:** Overview of charging infrastructure and technologies.

37.4 Sensor Technologies and Data Processing

Understanding the sensors used in autonomous systems, including LIDAR, RADAR, and cameras, as well as data process

Key Topics:

- **LIDAR and RADAR:** Functionality and applications in autonomous systems.
- **Cameras and Imaging:** Role of cameras in autonomous navigation and obstacle detection.
- **Data Processing Algorithms:** Techniques for processing and analyzing sensor data.

37.5 Machine Learning and AI for Autonomous Systems

Exploration of machine learning and artificial intelligence applications in autonomous decision-making and navigation.

Key Topics:

- **Machine Learning:** Applying ML algorithms for autonomous systems.
- **AI Decision-Making:** Implementing AI for navigation and obstacle avoidance.
- **Real-World Applications:** Case studies of AI and ML in autonomous vehicles and drones.

37.6 Communication Networks and IoT

Study of communication networks and the role of IoT in connecting autonomous vehicles and drones.

Key Topics:

- **Communication Protocols:** Understanding the protocols used in autonomous vehicle networks.
- **IoT Integration:** How IoT devices enhance connectivity in autonomous systems.
- **Network Security:** Ensuring secure communication in autonomous networks.

37.7 Control Systems for Autonomous Vehicles

Examination of control systems used for vehicle dynamics and operational management in autonomous vehicles.

Key Topics:

- **Vehicle Dynamics:** Basics of vehicle control and dynamics.
- **Control Algorithms:** Algorithms used for maintaining stability and control.
- **Operational Management:** Managing the operations of autonomous systems.

37.8 Ethical and Regulatory Aspects

Discussion on the ethical implications and regulatory challenges associated with the deployment of autonomous vehicl

Key Topics:

- **Ethical Considerations:** Addressing the ethical issues in autonomous system deployment.
- **Regulatory Frameworks:** Understanding the regulations governing autonomous vehicles and drones.
- **Compliance:** Ensuring compliance with legal and ethical standards.

37.9 Testing and Validation of Autonomous Systems

Processes involved in testing and validation methodologies to ensure the safety and reliability of autonomous systems.

Key Topics:

- **Testing Methodologies:** Techniques for testing autonomous systems.
- **Validation Processes:** Ensuring the reliability and safety of autonomous vehicles.
- **Case Studies:** Real-world examples of testing and validation.

37.10 Integration of Renewable Energy in Autonomous Systems

Investigating how renewable energy sources can be integrated into autonomous vehicles and drones to enhance sustai

Key Topics:

- **Renewable Energy Sources:** Types of renewable energy used in autonomous systems.
- **Integration Techniques:** Methods for integrating renewable energy into vehicle design.
- **Sustainability:** Promoting sustainable practices in autonomous vehicle engineering

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38.1.topics

4.1 .12.15.38.2:Specialist Engineering in Infrastructure and Contractors: Electrochemical Engineering

This Master's degree course offers in-depth knowledge in electrochemical engineering within the realm of infrastructu tackle complex engineering projects involving electrochemical systems. From battery technologies to electrochemical p

38.3.Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processe

38.4.Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging

38.5.Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for

38.6.and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to en

38.7..Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural

38.8.Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and me

38.9.Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

.38.10.Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materi

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tackle complex engineering projects involving electrochemical systems. From battery technologies to electrochemical p

38.3 Introduction to Electrochemical Engineering

Understand the basic principles of electrochemistry, including thermodynamics and kinetics, electron transfer processe

Key Topics:

- **Thermodynamics and Kinetics:** Fundamental principles governing electrochemical reactions.
- **Electron Transfer Processes:** Mechanisms of electron transfer in electrochemical systems.
- **System Design and Operation:** Designing and operating efficient electrochemical systems.

38.4 Battery Technologies for Infrastructure

Explore the various types of battery technologies used in infrastructure, including lithium-ion, lead-acid, and emerging

Key Topics:

- **Lithium-ion Batteries:** Structure, function, and applications.
- **Lead-acid Batteries:** Traditional uses and modern improvements.

- **Emerging Technologies:** Exploring the potential of solid-state and other advanced battery technologies.

38.5 Fuel Cells and Their Applications

Study the principles and applications of different types of fuel cells, focusing on their role in providing clean energy for

Key Topics:

- **Types of Fuel Cells:** Proton exchange membrane (PEM), solid oxide (SOFC), and others.
- **Clean Energy Production:** How fuel cells contribute to sustainable energy solutions.
- **Infrastructure Applications:** Real-world applications of fuel cells in infrastructure projects.

38.6 Corrosion and Its Prevention

Learn about the electrochemical processes involved in corrosion, methods of prevention, and materials selection to en

Key Topics:

- **Corrosion Mechanisms:** Understanding how and why corrosion occurs.
- **Prevention Methods:** Techniques to prevent and control corrosion.
- **Materials Selection:** Choosing materials to enhance durability and prevent corrosion.

38.7 Electrochemical Sensors and Monitoring

Understand the design and function of electrochemical sensors in monitoring environmental conditions and structural

Key Topics:

- **Sensor Design:** Principles of designing effective electrochemical sensors.
- **Environmental Monitoring:** Using sensors to monitor environmental conditions.
- **Structural Health Monitoring:** Applications in assessing the health and integrity of infrastructure.

38.8 Electrolysis and Industrial Processes

Explore how electrolysis is used in various industrial processes, such as water splitting for hydrogen production and me

Key Topics:

- **Electrolysis Basics:** Understanding the principles of electrolysis.
- **Hydrogen Production:** Using electrolysis for sustainable hydrogen generation.
- **Industrial Applications:** Applying electrolysis in metal plating and other industrial processes.

38.9 Sustainability and Electrochemical Engineering

Discuss the impact of electrochemical engineering on sustainable infrastructure development and the environment.

Key Topics:

- **Sustainability Principles:** Integrating sustainability into electrochemical engineering practices.
- **Environmental Impact:** Assessing and mitigating the environmental impact of electrochemical processes.
- **Sustainable Development:** Promoting sustainable infrastructure through innovative electrochemical solu

38.10 Advanced Topics in Electrochemical Engineering

Delve into advanced topics and current research trends in electrochemical engineering, such as nanostructured materi

Key Topics:

- **Nanostructured Materials:** Exploring the role of nanotechnology in electrochemical engineering.
- **Next-Generation Energy Systems:** Innovations in energy systems for sustainable infrastructure.
- **Current Research Trends:** Investigating the latest advancements and research in the field.

These courses provide a comprehensive understanding of electrochemical engineering in infrastructure and contractor developme

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40.Topics

4.1 .12.15..40.1Topics:Energy Storage and Battery Technology

This course explores advanced concepts in energy storage with a focus on battery technologies, essential for the integr their applications, and the technological advancements driving the sector. The course is designed for graduate student

40.2.Introduction to Energy Storage Systems

An overview of energy storage technologies and their importance in the modern energy landscape.

40.3.Battery Chemistry and Physics

Understanding the fundamental principles of various battery chemistries, including lithium-ion, lead-acid, and emergin

40.4.Design and Functionality of Battery Cells

Exploration of the design and operational principles of individual battery cells, and how they combine to form larger ba

40.5.Applications of Battery Storage

Examine how battery storage is used in various sectors such as electric vehicles, grid storage, and portable electronics.

40.6.Efficiency and Performance Measurements

Learn about the metrics used to measure the performance and efficiency of battery systems.

40.7.Safety and Environmental Impacts

Discussion of the safety protocols for batteries and their environmental impact, including recycling and waste manager

40.8.Advanced Energy Storage Technologies

Explore cutting-edge advancements in energy storage beyond current battery technology, such as supercapacitors and

40.9.Policy and Economics of Energy Storage

Examine the economic impacts, policy considerations, and market dynamics of implementing energy storage solutions.

40.10.Future Trends in Battery Technology

Insights into the future direction of battery technology research and its role in achieving a sustainable energy future.

41.1.Topics:

41.2.Advanced Robotic Process Automation in Electrical Engineering

This course aims to equip students with advanced knowledge and practical skills in implementing Robotic Process Auto to streamline and optimize engineering processes, focusing on automating complex electrical engineering tasks.

41.3.Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

41.4.RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineer

41.5.Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

41.6.Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

41.7.RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

41.8.Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineer

41.9.RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficie

41.10.Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical e

1.2 Advanced Robotic Process Automation in Electrical Engineering

This course aims to equip students with advanced knowledge and practical skills in implementing Robotic Process Auto to streamline and optimize engineering processes, focusing on automating complex electrical engineering tasks.

41.3 Introduction to Robotic Process Automation

An overview of RPA, its significance in the industry, and its application in electrical engineering.

Key Topics:

- **RPA Basics:** Understanding the fundamentals of Robotic Process Automation.
- **Industry Significance:** Exploring the importance and impact of RPA in various industries.
- **Applications in Electrical Engineering:** Specific use cases and benefits of RPA in electrical engineering.

41.4 RPA Tools and Technologies

Explore popular RPA tools like UiPath, Automation Anywhere, and Blue Prism and their specific applications in engineer

Key Topics:

- **UiPath:** Features and applications of UiPath in automating engineering tasks.
- **Automation Anywhere:** Understanding how Automation Anywhere can be used in electrical engineering.
- **Blue Prism:** Exploring Blue Prism's capabilities and use cases in the industry.

41.5 Automating Electrical Design Processes

Learn how to automate repetitive tasks in electrical design using RPA to increase efficiency and reduce human error.

Key Topics:

- **Repetitive Task Automation:** Identifying and automating repetitive tasks in electrical design.
- **Efficiency Improvement:** Enhancing efficiency and productivity through automation.
- **Error Reduction:** Minimizing human errors by implementing RPA solutions.

41.6 Data Migration and Management

Understanding the role of RPA in handling data migration and management in electrical engineering projects.

Key Topics:

- **Data Migration:** Techniques for automating data migration processes.
- **Data Management:** Using RPA to manage and organize large datasets.
- **Project Applications:** Implementing RPA for data handling in engineering projects.

41.7 RPA in Control Systems

Applications of RPA in the automation of control systems and simulation processes within electrical engineering.

Key Topics:

- **Control Systems Automation:** Using RPA to automate control system processes.
- **Simulation Processes:** Enhancing simulation processes through automation.
- **Case Studies:** Real-world examples of RPA applications in control systems.

41.8 Machine Learning and RPA

Integrating machine learning with RPA for enhanced decision-making and predictive maintenance in electrical engineer

Key Topics:

- **Machine Learning Integration:** Combining ML algorithms with RPA for advanced automation.
- **Predictive Maintenance:** Using ML and RPA for proactive maintenance strategies.
- **Enhanced Decision-Making:** Improving decision-making processes through intelligent automation.

41.9 RPA and IoT in Electrical Systems

Exploring the synergy between RPA and IoT to develop smart electrical systems with improved functionality and efficie

Key Topics:

- **RPA and IoT Integration:** Understanding how RPA and IoT can work together.
- **Smart Systems:** Developing smart electrical systems using RPA and IoT.
- **Efficiency and Functionality:** Enhancing system functionality and efficiency through integration.

41.10 Security and Ethics in RPA

Understanding the ethical considerations and security challenges associated with the deployment of RPA in electrical e

Key Topics:

- **Ethical Considerations:** Addressing ethical issues in RPA implementation.
- **Security Challenges:** Identifying and mitigating security risks in RPA systems.
- **Best Practices:** Implementing best practices for secure and ethical RPA deployment.

These courses provide a comprehensive understanding of advanced robotic process automation in electrical engineeri

44…Topics grand circulum summarise resolve probme outcome exercise :

44.1 reating a comprehensive and accurate calculation formulation for a master's degree in electrical engineering typi
outline a general approach to developing a calculation formulation in the context of electrical engineering:

44..1. Define the Problem

- Clearly state the engineering problem or objective.
- Identify the variables and parameters involved.
- Determine the constraints and assumptions.

2. Develop the Mathematical Model

- Formulate the equations governing the physical system (e.g., Ohm's law, Kirchhoff's laws, Maxwell's equa
- Use appropriate mathematical techniques to model the system (e.g., differential equations, linear algebr

3. Simplify the Equations

- Apply any necessary simplifications or approximations.
- Reduce the equations to a solvable form.

4. Analytical Solution (if possible)

- Solve the equations analytically using mathematical methods.
- Check the validity of the analytical solution within the defined constraints.

5. Numerical Solution (if necessary)

- If the analytical solution is not feasible, develop a numerical solution.

- Use numerical methods (e.g., finite element method, numerical integration).

6. Simulation and Validation

- Implement the model in simulation software (e.g., MATLAB, Simulink).
- Validate the results with experimental data or known benchmarks.

7. Optimization (if applicable)

- Optimize the solution for desired performance criteria (e.g., efficiency, cost).
- Use optimization techniques (e.g., genetic algorithms, gradient descent).

Example Calculation: Load Flow Analysis in Power Systems

Here's a simplified example of a calculation formulation for load flow analysis in power systems:

Step 1: Define the Problem

- Objective: Determine the voltage and phase angle at each bus in the power system.
- Variables: Bus voltages (V), phase angles (θ), real power (P), reactive power (Q).
- Constraints: Power balance equations, voltage limits.

Step 2: Develop the Mathematical Model

- Use the power flow equations: $$P_i = V_i \sum_{j=1}^{n} V_j (G_{ij} \cos \theta_{ij} + B_{ij} \sin \theta_{

the conductance and susceptance of the transmission line between buses ii and jj.

Step 3: Simplify the Equations

- Apply any necessary assumptions (e.g., flat start method with initial voltage guesses).

Step 4: Analytical Solution

- Not feasible for large power systems.

Step 5: Numerical Solution

- Use the Newton-Raphson method to solve the power flow equations iteratively.

Step 6: Simulation and Validation

- Implement the Newton-Raphson method in MATLAB.
- Validate the results with a test power system.

Step 7: Optimization

- Optimize the power flow to minimize losses or improve voltage stability.

By following these steps, you can create a robust and accurate calculation formulation for various electrical engineering

Electrical engineering encompasses a wide range of topics that involve various calculations. Here are some common ar

1. Circuit Analysis

- **Ohm's Law:** V=IRV = IR
- **Power Calculations:** P=VIP = VI, P=I2RP = I^2R
- **Kirchhoff's Laws:** Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL)
- **Impedance and Reactance:** Calculating the impedance (ZZ) of AC circuits, inductive reactance (XL=2πfLX_

2. Electromagnetics

- **Coulomb's Law:** F=keq1q2r2F = k_e \frac{q_1 q_2}{r^2}
- **Electric Field Calculations:** E=FqE = \frac{F}{q}
- **Magnetic Field Calculations:** Using Biot-Savart Law and Ampère's Law

3. Signal Processing

- **Fourier Transforms:** Transforming signals from time domain to frequency domain
- **Laplace Transforms:** For analyzing linear time-invariant systems
- **Z-Transforms:** Used in digital signal processing for discrete-time signals

4. Control Systems

- **Transfer Functions:** H(s)=Y(s)X(s)H(s) = \frac{Y(s)}{X(s)}
- **Stability Analysis:** Using Routh-Hurwitz criterion, Nyquist criterion, and Bode plots
- **PID Controller Tuning:** Calculations for proportional, integral, and derivative gains

5. Power Systems

- **Load Flow Analysis:** Solving the power flow equations using methods like Newton-Raphson or Gauss-Seid
- **Short Circuit Calculations:** Determining the fault current levels in a power system

- **Power Factor Correction:** Calculations to improve the power factor of electrical loads

6. Electronics

- **Transistor Biasing:** Calculations for setting the operating point of transistors
- **Amplifier Design:** Gain and bandwidth calculations for different types of amplifiers
- **Oscillator Design:** Frequency and stability calculations for oscillators

7. Digital Systems

- **Logic Gates and Boolean Algebra:** Simplifying Boolean expressions
- **Flip-Flops and Counters:** Timing and state analysis
- **Digital Signal Processing:** Sampling, quantization, and digital filter design

8. Communication Systems

- **Modulation Techniques:** Calculations for AM, FM, and PM systems
- **Signal-to-Noise Ratio (SNR):** Calculating the quality of a signal

Bandwidth Calculations: Determining the bandwidth requirements for various

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